

# TITANINE DOPE

See  
Advert.  
page 19

FIRST AERO WEEKLY IN THE WORLD

# FLIGHT

The  
AIRCRAFT  
WEER  
IPS

A JOURNAL OF  
PRACTICE, A

LOCOMOTION AND TRANSPORT.

Aircraft. Engines. Access. & Prep. & Tyres. Misc.  
9½ 5½ 9 2

OFFICIAL ORGAN OF THE ROYAL AERO CLUB OF THE UNITED KINGDOM.

No. 1052. (No. 8. Vol. XXI.)

Registered at the General Post  
Office as a Newspaper.

FEBRUARY 21, 1929.

SIXPENCE WEEKLY.

*In the Spring*

the young man's fancy lightly turns to thoughts of—flying. Why not a flying holiday this year? **Efficient wireless equipment** on a good aeroplane will make such a holiday as safe as it is interesting.

MARCONI'S WIRELESS TELEGRAPH CO., LTD., MARCONI HOUSE, STRAND, LONDON, W.C.2.

## MALLITE PLYWOOD

Telephone :  
BISHOPSGATE  
5841  
(4 lines).

USED BY THE LEADING AIRCRAFT MANUFACTURERS  
**THROUGHOUT THE WORLD.**

Telegrams :  
VICPLY  
KINLAND  
LONDON.

Manufactured to the **BRITISH AIR MINISTRY SPECIFICATION, 2.V.3.,** by

THE AERONAUTICAL & PANEL PLYWOOD CO., LTD., 218-226, KINGSLAND ROAD, LONDON, E.2.

### PACKERS & SHIPPERS OF AEROPLANES, ENGINES, MACHINERY, MOTOR-CARS, ETC.

The most extensive packing, shipping and storage  
riverside depot above bridges.  
Aeroplanes, etc., collected, packed and de-  
livered to F.O.B. Steamers.  
Through rates to all parts of the world.  
Eight cranes lifting up to 12 tons.  
Bonded warehouses for imported cars, etc.

**JOSEPH C. MOUNT & CO.,**

(Established for upwards of Quarter of a Century)

Stevenage Wharves, Fulham, S.W.6.

Phone : PUTNEY 2840 (3 lines).

**STRIP**

SPECIALISTS IN THE  
ROLLING AND HEAT  
TREATMENT OF  
**AIRCRAFT STRIP**  
AND SHEET STEEL.

TO ALL AIRCRAFT  
SPECIFICATIONS.

**J. J. HABERSHON & SONS**  
LTD.  
HOLMES MILLS, ROTHERHAM.

**STEEL**

### CELLON LTD.

CONTRACTORS TO  
H.M. GOVERNMENT

Cellon Works, Upper Ham Road,  
Kingston-on-Thames.

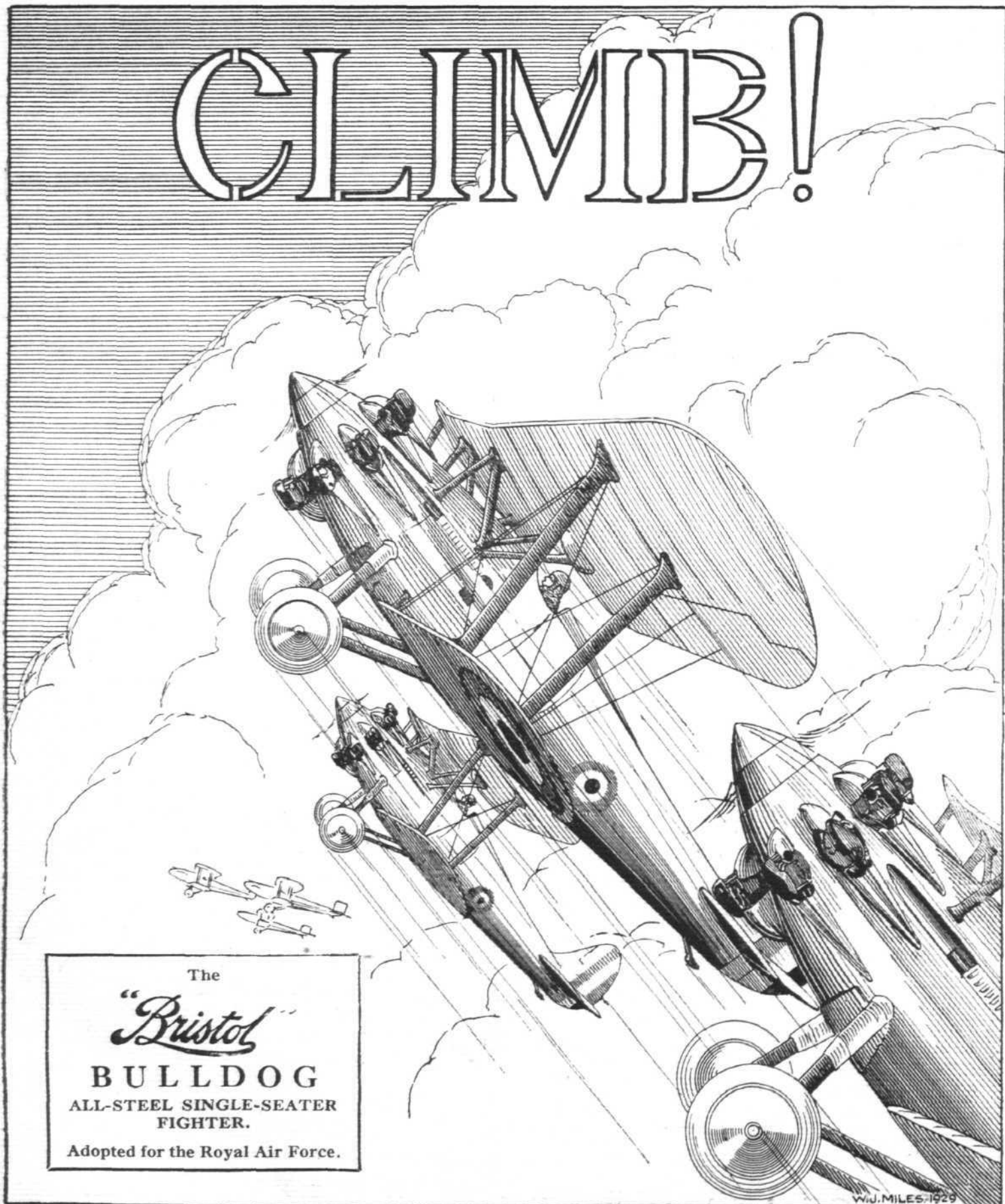
Telegrams : "AJAWB, Phone, Kingston-on-Thames."  
Telephone : KINGSTON 6061 (5 lines).

# CELLON

DOPE

*"Bristol"*

CLIMB!



The  
*"Bristol"*  
**BULLDOG**  
ALL-STEEL SINGLE-SEATER  
FIGHTER.  
Adopted for the Royal Air Force.

Telegrams: "Aviation, Bristol."

Telephone: 3906 Bristol.

THE BRISTOL AEROPLANE CO., LTD., FILTON, BRISTOL.

Kindly mention "Flight" when corresponding with advertisers.



# PIONEERS . . . .

**W**E were pioneers in the production of flying boats and amphibians. From the earliest days our unique experience of the design and construction of high speed motor boats has placed us in an especially favourable position as regards the production of seaworthy marine aircraft. And under a new and progressive policy we shall continue throughout 1929 the high standards of workmanship and design which have made the name of SAUNDERS synonymous with quality for nearly a hundred years.

**High speed passenger tenders for flying boat services.**

**Motor boats for servicing marine aircraft.**

**S. E. SAUNDERS LTD.,**

**EAST COWES,  
ISLE OF WIGHT**

**BUSH HOUSE,  
ALDWYCH W.C.2.**

*Designers and Constructors of all Types of Aircraft.*

## **GEORGE PARNALL & CO.**

PROPRIETOR GEORGE G. PARNALL.

**AIRCRAFT DESIGNERS & CONSTRUCTORS.**

Telephone :  
No. 4773 (3 LINES).

Telegrams :  
"WARPLANES,  
BRISTOL."



The Parnall "Imp" with Armstrong-Siddeley "Genet" engine.

FACTORIES :  
PARK ROW, BRISTOL.  
FEEDER ROAD, BRISTOL.  
QUAKER FRIARS, BRISTOL.  
MIVART STREET, BRISTOL.



**COLISEUM WORKS  
PARK ROW  
BRISTOL**



LONDON OFFICE :  
EVELYN HOUSE, 62, OXFORD ST.,  
W.1. TEL. : MUSEUM 7101.  
EXPERIMENTAL WORKS, AND TEST  
STATION :  
YATE AERODROME,  
GLOUCESTERSHIRE.  
TEL. : CHIPPING SODBURY 50.

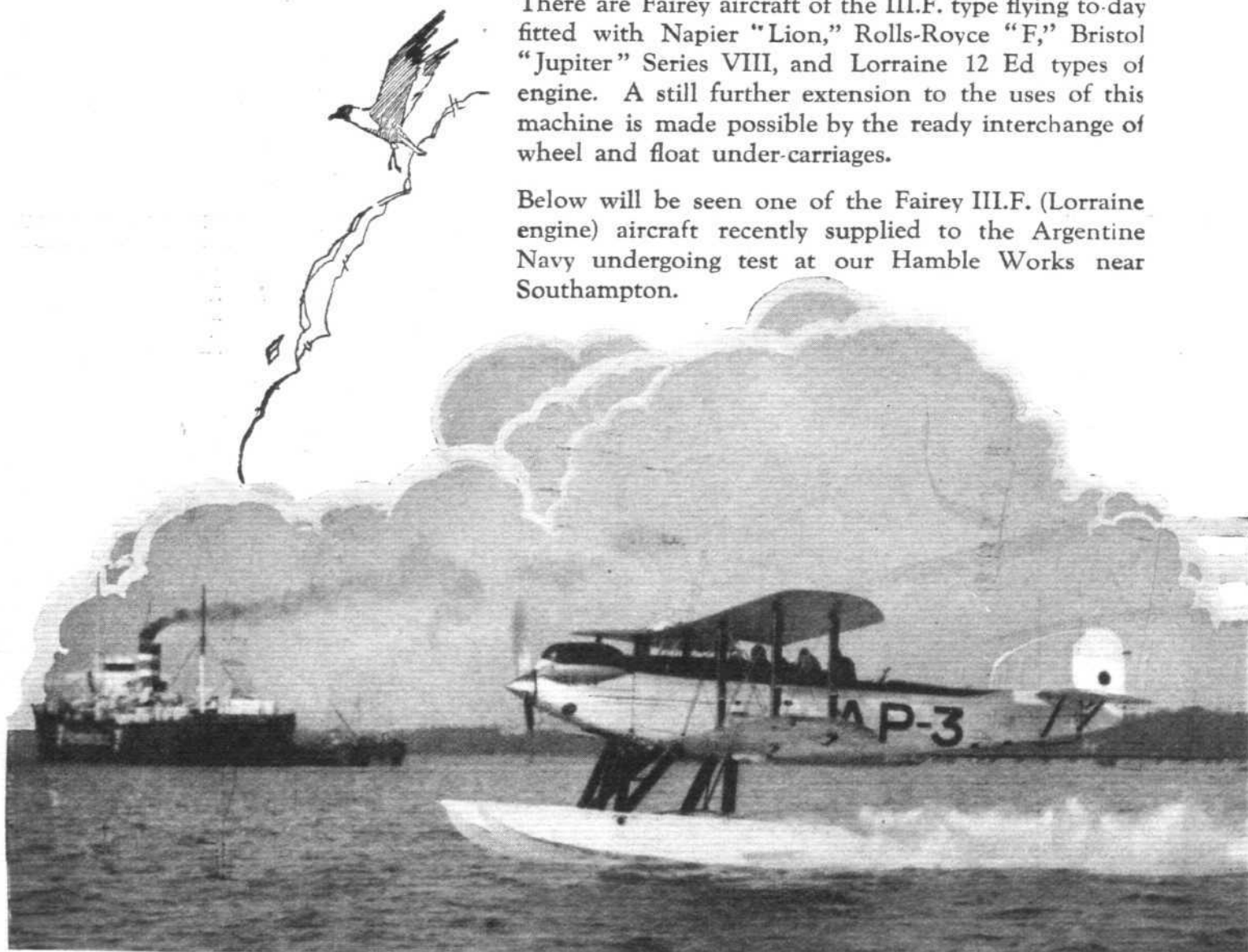
*Save time by using the Air Mail.*

# FAIREY AIRCRAFT

## ADAPTABILITY

The extensive adaptability of Fairey aircraft is already well-known. This important characteristic is apparent not only from the wide scope of their service, performance, and general utility, but is also made additionally evident by the wide variety of engines, both air- and water-cooled, that can be installed. There are Fairey aircraft of the III.F. type flying to-day fitted with Napier "Lion," Rolls-Royce "F," Bristol "Jupiter" Series VIII, and Lorraine 12 Ed types of engine. A still further extension to the uses of this machine is made possible by the ready interchange of wheel and float under-carriages.

Below will be seen one of the Fairey III.F. (Lorraine engine) aircraft recently supplied to the Argentine Navy undergoing test at our Hamble Works near Southampton.



THE FAIREY AVIATION COMPANY LIMITED  
HEAD OFFICE AND WORKS: HAYES, MIDDLESEX.

*Kindly mention "Flight" when corresponding with advertisers.*



# FLIGHT

The  
AIRCRAFT  
ENGINEER  
&  
AIRSHIPS

First Aeronautical Weekly in the World. Founded January, 1909

Founder and Editor : STANLEY SPOONER

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport

OFFICIAL ORGAN OF THE ROYAL AERO CLUB OF THE UNITED KINGDOM

No. 1052. (No. 8. Vol. XXI.)

FEBRUARY 21, 1929

Weekly, Price 6d.  
Post free, 7d.

## Flight

The Aircraft Engineer and Airships

Editorial Offices : 36, GREAT QUEEN STREET, KINGSWAY, W.C.2.

Telephone : Holborn 3211. Telegrams : Truditur, Westcent, London.

Annual Subscription Rates, Post Free.

United Kingdom .. 30s. 4d. Abroad .. 33s. 0d.\*

\* Foreign subscriptions must be remitted in British currency.

### CONTENTS

	PAGE
Editorial Comment :	
Penny-Farthing Flying .. .. .	129
Hectic Prospects .. .. .	130
The Wherewithal .. .. .	130
First British Flight .. .. .	130
New De Havilland "Hawk Moth" Cabin Monoplane .. .. .	131
Early British Flights .. .. .	132
Royal Aero Club Official Notices .. .. .	134
Guggenheim Report .. .. .	135
Eddies .. .. .	136
Private Flying: Flying as a Profession .. .. .	137
Rotterdam Light 'Plane Meeting .. .. .	139
Light 'Plane Clubs .. .. .	140
Air-cooled Engines in Service: by A. H. R. Fedden .. .. .	142
Airisms From the Four Winds .. .. .	146
In Parliament .. .. .	147
Aeroplane Types: The Macchi "M-70" .. .. .	148
Royal Air Force .. .. .	149
"Staybrite" at Birmingham Fair .. .. .	150
Imports and Exports .. .. .	150

### " FLIGHT " PHOTOGRAPHS

To those desirous of obtaining copies of "Flight" Photographs, these can be supplied, enlarged or otherwise, upon application to Photo. Department, 36, Great Queen Street, W.C.2.

### DIARY OF CURRENT AND FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in this list—

1929.	
Feb. 28	.... Lecture, "The Flutter of Aeroplane Wings," by R. A. Frazer, before R.Ae.S. and Inst.Ae.E.
Mar. 7	.... Lecture, "Aircrew Body Interference," by C. N. H. Lock, before R.Ae.S. and Inst.Ae.E.
Mar. 14	.... Lecture, "Engine Performance Tests," by Wing-Commandr. C. B. Hynes, before R.Ae.S. and Inst.Ae.E.
Mar. 18	.... Lecture, "The Helicogyra," by V. Isacco, before R.Ae.S. and Inst.Ae.E.
Mar. 27	.... Royal Aero Club Annual General Meeting.
Mar. 29-30	.... Cinque Ports Flying Club Easter Meeting, Lympne.

## EDITORIAL COMMENT



Of all the extremely interesting and valuable papers read before the Royal Aeronautical Society in recent years, few have equalled that read by Mr. Roy Fedden on February 14 entitled "Air-Cooled Engines in Service." The paper was a very long one, and even a summary of it has been found too long to be published in one issue of FLIGHT. We have, therefore, thought that rather than reduce the value of it by too drastic cutting, it would be preferable to divide the Penny-Farthing Flying summary, and the first part appears in the present number. Unfortunately, this necessitates holding over the section of the paper which was, perhaps, the most controversial, although at the actual meeting there were few who, during the discussion, challenged even this section of Mr. Fedden's paper. The lecturer was, many considered, a little hard on the "in-line" air-cooled aero engine, for which he did not foresee any great future except in the smaller powers. Be that as it may, the aviation world owes Mr. Fedden a great deal for producing the very interesting statistics which he had managed to collect (not, we are sure, without considerable difficulty), and which seemed fully to justify his claim that the radial air-cooled engine has already, after comparatively few years of development, established itself as a very reliable and economical power unit.

Tables giving statistics will be found elsewhere in this issue, from which readers may glean much useful information. During the discussion of Mr. Fedden's paper Captain Walker, of A.D.C. Aircraft, Ltd., called attention to the figures from the Bristol and Wessex Aero Club, which indicated, among other things, that the cost per running hour of a "Cirrus" engine had at that club worked out at 1.1s. This figure included maintenance, overhaul and spares, but not, presumably, insurance. Taking an average petrol consumption for the engine, and an average cruising speed, Captain Walker worked out the cost per running hour, inclusive of petrol oil and the items mentioned above, but not insurance, at about 1½d. per mile! Bearing in mind that

the average machine in which the "Cirrus" engine is installed is a two-seater cruising at something like 80 m.p.h. a total engine running cost of less than a penny-farthing a mile for two people at more than express train speed cannot really be regarded as extravagant! The figure is, in fact, rather startling, but represents the average of five engines in use at the Bristol Club over a period of two years.

If the period had been longer, for instance, five years, it is to be assumed that the maintenance cost and cost of spares would have slightly increased the average, but, even so, there is a long way to go before the running cost of one of these small engines becomes a very serious item. The aeroplanes themselves, barring an untimely end due to crashes, last for very many years indeed (for example, the first "Moth" ever built is still in existence), without much being expended on them in the way of upkeep and replacements, and the one item which now brings the cost of running a light 'plane up to a serious extent is insurance, which is, of course, highly due to the possibility of crashes. It would seem, therefore, that, even looking at the matter merely from the point of view of £ s. d., what we have to do to make flying really cheap, at least as far as the light 'plane is concerned, is to make the chance of crashing even more remote than it is now. How that is to come about cannot be discussed in detail here, but doubtless the automatic slot, with its latest improvement the "interceptor," used in conjunction with an undercarriage that will really absorb shock and permit stall-landings to be made safely, might go a long way towards attaining that ideal.

❖ ❖ ❖

#### Hectic Prospects

Whether the long-expected "boom" in aviation is really to start this year or not, the British aviation community will have in 1929 one of the most memorable years of its whole existence. Never before has British aviation had to face such a formidable list of "fixtures." Presumably we shall start with a number of meetings at various places at Easter. So far only the Cinque Ports' meeting at Lympne has been announced. Another set of meetings at Whitsun will get us well towards summer. Then in June there is, towards the end of the month, the four-days' meeting for light 'planes at Rotterdam, in which we hope a number of British private owners will take part. The King's Cup Race takes place the following week, and a week later we have the Royal Air Force Display at Hendon. On the Tuesday after that the International Aero Exhibition opens at Olympia, and while that is in progress a meeting, race and/or rally is to be held, probably at Heston. We have now reached the end of July, and the next excursion will be to the French Light 'Plane Meeting at Orly, which occupies the first fortnight in August. After two or three week's rest, we shall all be at Cowes for the Schneider Trophy contest, and this will be the culminating event of the year, but previously we shall probably have crowded at least one meeting in somewhere for August Bank Holiday. Phew!

❖ ❖ ❖

#### The Where-withal

British aviation representatives of one sort and another have received abroad so much hospitality that when the opportunity occurs we can do no less than return it in full. Exactly how that is to be achieved is not at all clear. Certainly the Royal Aero Club cannot afford to "foot the bill" entirely. Apart

from any other events, the Schneider Trophy contest is going to be an expensive affair, and it will not be possible for the club to make expenses by charging admission to the "aerodrome" as can be done in the case of landplane events. Sir Charles Wakefield, that tireless supporter of aviation, has come forward with an offer of £5,000 towards Royal Aero Club expenses. What we should do without Sir Charles one really cannot imagine. His generosity in all manner of directions, but particularly in aviation matters, seems well-nigh inexhaustible, and he has already done more to encourage flying than one had any right to expect from any one man. His latest gift will be of national importance in that it will assist very materially towards helping British prestige by placing us in a position to extend to our many foreign visitors a hospitality worthy of our great nation.

But even Sir Charles' magnificent gift will not suffice. It seems likely that at least £20,000 will be required to enable England to discharge her rôle as host in the way it ought to be done. The Treasury, *via* the Air Ministry, has spent and will be spending quite large sums of money on the production of the British Schneider Trophy defenders, and cannot well be expected to do more. It would seem, therefore, that a fund should be established, with Sir Charles Wakefield's splendid gift as a "nest egg," to which every British citizen interested in aviation could contribute. In this way everyone could feel that he (or she) was doing something, even if only a little, towards entertaining in a fitting manner all the distinguished foreign visitors whom we may expect during the Schneider week. There are difficulties in the way, certainly, but we believe such a fund to be, taking it all round, the most satisfactory way of ensuring that our visitors this year shall not go away with a poor opinion of British hospitality.

❖ ❖ ❖

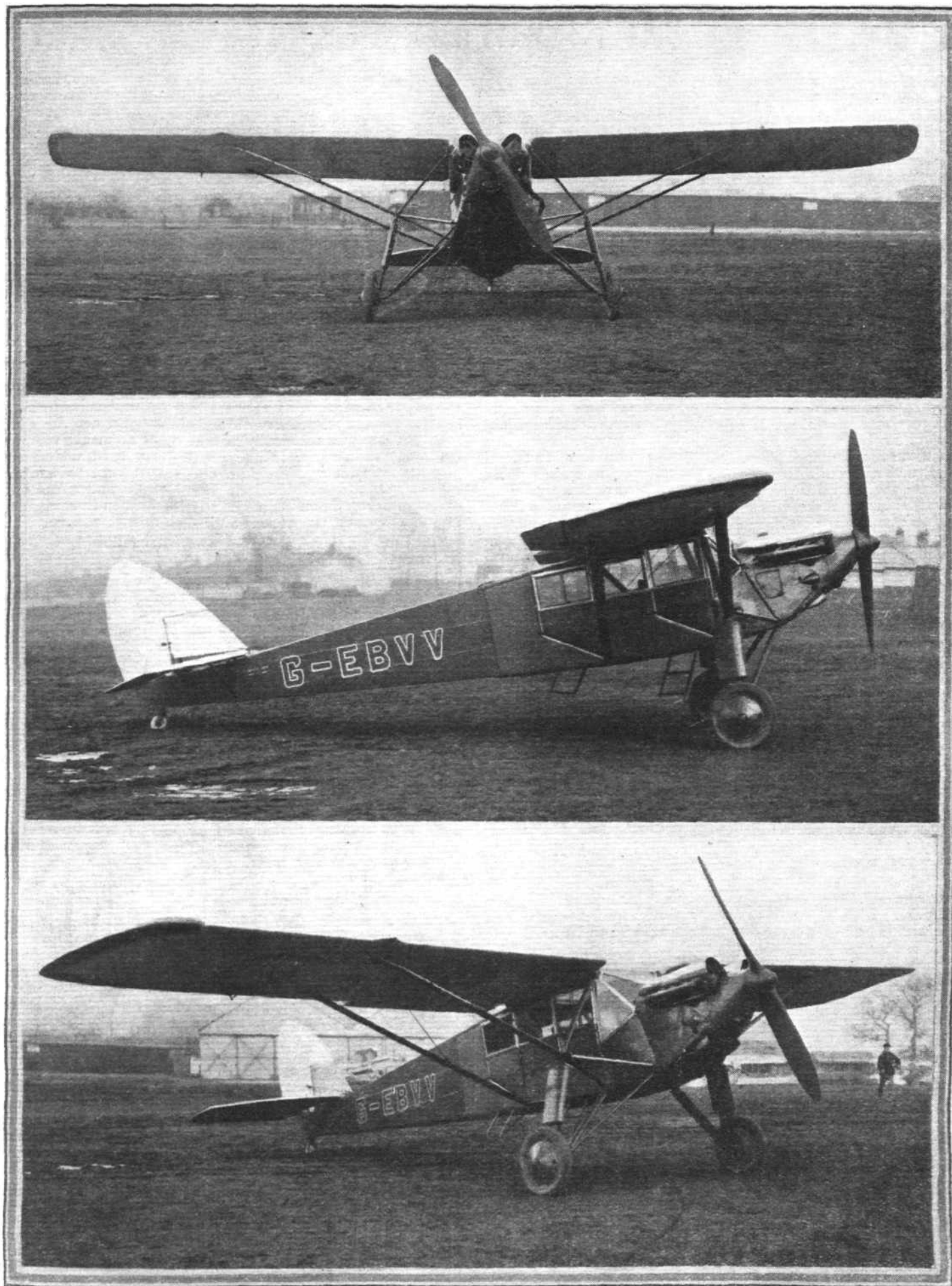
#### First British Flight

His many friends will sympathise very sincerely with "A. V." in connection with the findings of the report (published elsewhere in this issue) of the committee set up by the Royal Aero Club to examine the various claims to the honour of being the first Englishman to make a free flight over British soil. Yet it is difficult to see how the committee could have arrived at any other conclusion after examining the evidence before it. By its terms of reference it was precluded from examining the claims of Maxim and Cody, neither of whom was a naturalised British subject at that time.

Mr. Roe's claim was disallowed by the committee because his flights did not appear to the committee to meet the definition of "free flight" as laid down by them. This definition was as follows: "Free flight in an aeroplane occurs when the machine, having left the ground, is maintained in the air by its own power on a level or upward path for a distance beyond that over which gravity and air resistance would sustain it." One might disagree slightly with the wording "gravity and air resistance," the use of the expression "air forces" being preferable, but that would merely be splitting hairs.

Lieut.-Col. Moore-Brabazon's claim was substantiated, and May 2, 1909, will henceforth stand as the date when a British subject first made a free flight in the British Isles. The distinction goes well with British "Certificate No. 1."





[“FLIGHT” Photographs]

THE NEW DE HAVILLAND “HAWK MOTH” CABIN MONOPLANE: These three views give a good idea of the general lines of the machine. A description and general arrangement drawings were published in our issue of February 7. The engine is an eight-cylinder Vee air-cooled, the de Havilland “Ghost.” This machine has accommodation for pilot and three passengers. Note the very wide wheel track, which should prevent overturning on the ground in a strong side wind. (See also pages 139, 141.)



# EARLY BRITISH FLIGHTS

SOME time ago the Royal Aero Club of Great Britain appointed a committee, with the following terms of reference:

"To investigate the claims of British subjects to early flights with a view to establishing who was the British subject to make the first flight in a heavier-than-air aircraft in the British Isles, and the date of such flight." The committee included The Right Hon. Lord Gorell, Chairman, Captain G. de Havilland, Lieut.-Col. W. Lockwood Marsh and Harold E. Perrin, Secretary.

Following is the report of the committee:

The committee met at the Royal Aero Club, 3, Clifford Street, London, W.1, on Thursday, December 6, 1928, Wednesday, January 2, and Tuesday, January 29, 1929. Present (on each occasion): The Right Hon. Lord Gorell, in the Chair, Captain G. de Havilland, Lieut.-Col. W. Lockwood Marsh. In attendance: Harold E. Perrin, Secretary, B. Stevenson, Assistant Secretary.

1. The committee decided that, for the purposes of their investigation, free flight in an aeroplane occurs when the machine, having left the ground, is maintained in the air by its own power on a level or upward path for a distance beyond that over which gravity and air resistance would sustain it.

2. The committee also decided that they were excluded by their terms of reference from considering the claims either of the late Mr. S. F. Cody or of the late Sir Hiram Maxim, neither of whom was a British subject in 1908 and the summer of 1909. The late Mr. S. F. Cody did not take out his naturalization papers until October, 1909. Moreover, in the claim to a flight in 1894, submitted on behalf of Mr. Hiram Maxim, as he then was, it was admitted that it was not a free flight, and this claim did not, therefore, come under the definition laid down by the committee for the purposes of their investigation as set out in paragraph 1. The following British claimants appeared before the committee:—Mr. A. H. Phillips, Mr. A. V. Roe, Lieut.-Col. J. T. C. Moore-Brabazon, M.C., M.P.

3. *Mr. A. H. Phillips.*—Mr. A. H. Phillips submitted particulars of the experiments of his father, Mr. Horatio Frederick Phillips, commencing in 1887 down to 1911, and claimed to have made his first flight in 1887, but was unable to produce any corroborative evidence in support of any of his claims.

4. *Mr. A. V. Roe.*—Mr. A. V. Roe claimed to have made flights at Brooklands, Weybridge, in June, 1908, and produced to the committee two certificates signed by employees at Weybridge Track, as follows:—

June 2, 1912.

"This is to certify that I saw Mr. A. V. Roe on his flying machine on Whit-Monday in the year 1908, rise from the ground of Brooklands Motor Course for about 25 yards (75 ft.). Also, on one occasion I saw him fly for several feet, when his propeller came off, and caused him to land."

(Signed) W. BOXALL,  
Gainswood Lodge,  
Byfleet Road,  
Weybridge.

Brooklands Land, Weybridge.  
July 13, 1912.

"This is to certify that I saw, on a Saturday evening about the middle of June in the year of 1908, Mr. A. V. Roe make a flight on his 24 h.p. Antoinette-driven aeroplane of about 150 ft. at a length of 3 ft. high, only his propeller blade breaking causing him to come down on to the track."

(Signed) E. C. HARPER.

5. *Mr. A. V. Roe*, in his evidence, stated that he was unaware at the time (June, 1908) that the flights had been witnessed. In 1912 when he heard that certain people had seen him flying at Brooklands, he got in touch with them and obtained the certificates quoted above.

The committee had before them the following letter dated August 14, 1908, written by Mr. A. V. Roe to the late Mr. Wilbur Wright:—

"Perhaps you may remember me writing to you some three years ago, which letter you were kind enough to answer, asking if I could represent you in England, and also stating I had had successful flights with model aeroplanes. Since then I won the 'Daily Mail' model flying machine competition last year, there were over 200 entries, 129 exhibited and only about four entrants, out of all this number, were working in the right direction.

"I then built a full-sized machine entirely alone, but have had great difficulties with the Brooklands Track Manager, as he used to point out to me every now and then 'It was a motor-car track not an aeroplane track.' I was only allowed on track between 9 and 10 in the morning, and was not allowed to make a section of the railings detachable, which would have enabled me to take my aeroplane on to track unassisted, whereas it had to be lifted over some 8-foot gate posts, a difficult task for eight people. So I managed to carry out my trials in the early hours before the officials were about, by detaching some railings; some friends used to smuggle themselves in the night before a trial, in all I managed to get six trials since receiving the 18-24 h.p. Antoinette engine last May, and was fast making progress when I had to leave in July, his excuse being they wanted the ground my shed stood upon, I already having had to move my shed only last March at my own expense, as he would not let me erect it in the first place in a position where it could remain when racing started.

"I managed to make several flights towed by a motor car, the power required being very slight. At present my machine is detached and stowed away in the coach-house here." &c.

6. Mr. Roe was asked why he had made no mention in this communication of the free flights in June, 1908, which were now the subject of his claim, and stated that he had not regarded these as of importance and further, that it had been extraordinarily difficult for him to decide when in these early flights he was off the ground and when not.

On June 26, 1909, Mr. Roe wrote the following letter to FLIGHT:—

"It may come as a surprise to your readers to learn that I have been making dozens of short flights with my British-built aeroplane during the last few weeks; true, they are hardly more than jumps, being only 2 ft. and 3 ft. high and 50 ft. or so in length.

"Personally, I would have preferred to let this fact leak out on its own accord by winning the £100 and £1,000 prizes for the 100 yards and 1 mile flight respectively, but, to be candid, to carry 40 lbs. per h.p. has proved a bigger task than I calculated on, for my machine with self aboard, weighs 400 lbs, and is driven by a 10-h.p. air-cooled J.A.P. motor-cycle engine; but I am confident there is sufficient power, and there is every reason to believe I shall continue to get better results with further experiments. Although I have been trying various gear-ratios, pitches, width of blades, diameters, two- and four-bladed propellers, and have kept a careful record of each experiment, there still remains quite a number of varieties to be tried yet.

"Carrying 40 lbs. per h.p. seems easy enough on paper, but rather different in practice.

"The reason the above announcement is made, is because I feel confident that the machine I am now experimenting with has reached a stage well worth while copying and building in numbers, as it is so light and handy, and will obviously keep afloat under perfect control with a little more thrust.

"Perhaps my experience may be of interest. The first two flights the machine heeled over, and broke the left tips of lowest plane on both occasions. I thought this was due to the torque of propeller, but am glad to say it was my bad steering, and should the machine lurch over, a slight twist of planes brings it back instantly; but running against winds of 12 m.p.h. or less, the machine practically balances itself. It can be steered entirely by twisting main-planes in conjunction with rear vertical rudder when running along the ground, and the front or back of machine can be raised first, according to the angle of main-planes.

"I usually run along with main-planes at a slight angle; this allows machine to gain speed, and the tail to rise; on increasing the angle of main-planes to about 10° the front comes off the ground, but owing to insufficient thrust it soon comes down again; while it is up it is quite obvious how quickly the machine answers to the steering." &c.

7. Mr. Roe produced to the committee the following letter from Mr. H. H. Morris:—

December 18, 1928.

"I have to thank you for yours of the 14th instant, and am sorry to say that I have no record of the actual date when I first saw your machine leave the ground at Brooklands. I have always regretted that I did not keep a diary of these early events, but as far as I can remember it happened in the

# VICKERS

## (AVIATION) LIMITED

### ACCESSORIES for AIRCRAFT.

*Enquiries of Aircraft Constructors and Users are invited for the following specialities manufactured by VICKERS (AVIATION) LIMITED and used largely in aircraft supplied to the Royal Air Force :—*

VICKERS (Patent) PETROL COCKS (Light Pattern).  
VICKERS PETROL PUMPS (Hand-operated & Wind-driven).  
FOOT VALVES. NON-RETURN VALVES.  
PETROL FILTERS. RELIEF VALVES.  
FLOW INDICATORS. OIL COCKS.  
VICKERS-DAVIS NAVIGATION LAMPS (Light Pattern).  
GENERATING EQUIPMENT FOR AIRCRAFT LIGHTING.  
VICKERS-REID CONTROL INDICATOR.  
VICKERS-POTTS OIL COOLERS.  
VICKERS OLEO-PNEUMATIC UNDERCARRIAGE  
AND TAIL SKID SHOCK ABSORBING UNITS.  
VICKERS UNIVERSAL PULLEYS & GUARDS FOR  
LIGHT CONTROLS.  
STREAMLINE WIRES AND SWAGED TIERODS.  
"MALLEVILLE" ADJUSTABLE PIPE CLIPS.

*Head Office :*

**VICKERS HOUSE,  
BROADWAY, LONDON, S.W.1.**

*Works : WEYBRIDGE, SURREY.*

*Telephone :*  
VICTORIA 6900.

*Telegrams :*  
VICKERS, SOWEST, LONDON.



*Save time by using the Air Mail.*



## CIRRUS CHOSEN FOR 5 NEW TYPES OF FOREIGN LIGHT AEROPLANES.

During the month of January the Company delivered 18 Cirrus Mk. III. engines for installation in Moth Aircraft of the latest type, to the order of the Canadian Government, and 20 Cirrus Mk. III. for installation in Avian Aircraft for despatch to China. Other deliveries during January included 6 Cirrus Mk. III. for installation in new types of light aeroplanes manufactured by five different Aircraft Constructors abroad.

SPECIFY A CIRRUS—THE PROVEN LIGHT AERO ENGINE.

Manufacturers :

**CIRRUS AERO ENGINES LTD.,**

Regent House,

89, KINGSWAY, LONDON, W.C.2.

Telephone :  
HOLBORN 4076;

Cables :  
"AIRDISCO, LONDON."

*Kindly mention "Flight" when corresponding with advertisers.*





old finishing straight at the track, and the machine dropped somewhat suddenly with serious results to a number of the straining wires.

"If I can be of any service to you on the 2nd, please consider me at your disposal."

(Signed) HERBERT H. MORRIS.

8. Mr. Morris, on request, wrote a further letter which is as follows:—

January 7, 1929.

"Unfortunately, owing to a misunderstanding with Mr. Roe I was out of town last week, but at his request I give you below my recollections of what happened at Brooklands.

"Date: I am not in a position to fix this in any definite way but to the best of my recollection it was in the early part of 1908. The machine was wheeled out on to the finishing straight and certainly rose under its own power—to what height I could not say, but it dropped with sufficient force to break a number of the straining wires. A.V.R. at the time gave me his opinion that it had given him another fortnight of hard work.

"As far as my memory serves me, no measurements were taken."

(Signed) HERBERT H. MORRIS.

9. Lt.-Col. J. T. C. Moore-Brabazon, M.C., M.P.—Lt.-Col. Moore-Brabazon claimed to have made a flight at Eastchurch, during the week-end, April 30–May 2, 1909. The committee received evidence that Lt.-Col. Moore-Brabazon was flying in France, towards the end of 1908, and made a flight of over 5 km. on a "Voisin" biplane at Chalons on January 17, 1909. This, however, was abroad, and is relevant to the committee's inquiry only as to previous capability. His claim to the flight at Eastchurch during the week-end April 30–May 2, 1909, was corroborated by Mr. Oswald Short, who appeared before the committee and handed in the following statement:—

"I well remember Mr. J. T. C. Moore-Brabazon (now Lt.-Col. J. T. C. Moore-Brabazon, M.C., M.P.), making a flight on an aeroplane named 'The Bird of Passage' at Leysdown, Isle of Sheppey, in the early part of 1909. I cannot, from personal memory, give the exact date of this flight, but it was recorded some days later in the aircraft journal *FLIGHT*, in the issue dated May 8, 1909 (page 268). This was the first flight I ever witnessed, and in addition to that fact, it is impressed upon my memory by an incident that happened:—I was one of several persons who held on to the tail of the machine whilst the engine was being run for warming-up purposes. When the pilot wished to start, I failed to see the signal 'let go,' and was dragged along the ground for some distance, when the machine started to move. After running along for some distance, the machine rose into the air to a height which I estimate to have been from 50 to 80 ft. and a distance of from a quarter to half a mile. It flew from a position in front of our workshop on the marshes at Leysdown, towards a house known as 'Mussel Manor.' On

making a left-hand turn, the machine lost height and, touching the ground with one wing, crashed.

"With others I ran towards the spot, and we were all relieved to find the pilot unhurt."

(Signed) HUGH OSWALD SHORT.

January 2, 1929.

10. This flight was also reported in *FLIGHT* of May 8, 1909, and in the *Automotor* of the same date, as follows:—

"MR. MOORE-BRABAZON FLIES.

"During last week-end, Mr. Moore-Brabazon made his first flights in England at the Aero Club's new ground at Shellbeach, and although he did not attempt any very lengthy flights, this was only due to the fact that the apparatus needed a little adjustment after its re-erection. On Friday, a flight of about 150 yards was made, while on the next day, 200 yards were covered and the experiments were brought to a conclusion, owing to the wind increasing in force. A still longer flight was made on Sunday, when a trip of 500 yards was made and could have been prolonged indefinitely, but for the fact that certain parts of the mechanism were not working quite properly. In consequence, Mr. Moore-Brabazon decided to come down, and in doing so, met with a slight accident to one of the wings. By the time this is in print, however, this will be rectified, and Mr. Moore-Brabazon may, at any moment, be heard of accomplishing an appreciable journey in the air."

11. Findings.—

(a) The committee are of opinion that the claim of Mr. A. H. Phillips cannot be entertained.

(b) The committee are of opinion that the flights claimed by Mr. A. V. Roe in 1912 as having been made by him in June, 1908, cannot be substantiated as coming under the definition of free flight laid down by the Committee for the purposes of their investigation, as set out in para. 1, and that his claim to be the first British subject to fly in the British Isles cannot, therefore, be admitted.

(c) The committee are of opinion that the flight of Lt.-Col. J. T. C. Moore-Brabazon, during the week-end April 30–May 2, 1909, comes under the definition of a free flight, as laid down by the committee, that the evidence of Mr. Oswald Short must be taken as corroborative of the flight recorded in *FLIGHT* and the *Automotor* of May 8, 1909, as occurring at Shellbeach on the Sunday of the week-end referred to, and that May 2, 1909, should, therefore, be accepted as the date on which a British subject first made a flight in the British Isles. Their conclusion, accordingly, is that the claim of Lt.-Col. J. T. C. Moore-Brabazon is substantiated, and should be placed upon record.

12. The committee desire to acknowledge, with cordial thanks, the assistance they have received throughout the inquiry from Commander Perrin.

The Report is signed by Lord Gorell, Chairman, G. de Havilland, W. Lockwood Marsh, members of the committee; and Harold E. Perrin, Secretary.

## A NEW FLIGHT TO AUSTRALIA

### Vickers "Vellore" (Armstrong-Siddeley "Jaguar") Chosen

FLIGHT-LIEUT. S. J. MOIR, R.A.A.F., and Pilot Officer H. C. OWEN, R.A.A.F., were the first Australians to plan a flight from Australia to England and back. They started on a Ryan monoplane (220 Wright "Whirlwind") on November 5, 1928, accompanied by Mr. Hurley, a lecturer, and reached Athens successfully. In taking off, however, on a very heavy aerodrome their machine got bogged, and crashed in consequence. They came on to England by land and sea and decided to obtain a machine on which to fly home again. A Vickers "Vellore" was selected for the purpose, specially equipped with a 460 h.p. Armstrong-Siddeley geared-type engine, an improved edition of the engine that Sir Alan Cobham flew to Australia and back a few years ago and similar to the new engines being built for the latest Imperial Airways' air-liners. A feature of the 14-cylinder geared "Jaguar" is that the propeller runs at two-thirds of the crankshaft speed, which enables the engine to turn faster and, therefore, give more power, and the propeller to turn slower, and in consequence more efficiently.

Both men are experienced pilots, Pilot Officer Owen being, in addition, an expert on engines and on the Armstrong Siddeley "Jaguar" particularly, as he has been on the technical side of the R.A.A.F. Flight-Lieut. Moir joined the R.F.C. in 1917 and served in France in No. 3 Australian Squadron. After the War he joined the Citizen Air Force.

Owen was engineer of the Wackett "Widgeon," an Australian-built machine fitted with a "Jaguar" engine which flew a distance of 8,000 miles round Australia to meet the R.A.F. Supermarine "Southampton" flying-boats last year. In 1927 he accompanied Air Commodore Williams in a D.H. 50 Siddeley "Puma" on the first Service Survey flight to be undertaken in Australia, the total distance being 13,000 miles. This latest flight from Brooklands, Weybridge, to Australia, will be along the following route: Weybridge, Marseilles, Rome, Malta, Benghazi, Cairo, Ramleh, Baghdad, Basra, Bunder Abbas, Karachi, Agra, Calcutta, Rangoon, Bangkok, Sinagora, Singapore, Batavia, Sourabaya, Bima, and Darwen. The distance between the last two places is 950 miles across sea.

The machine is a standard Vickers "Vellore," which is a single-engine tractor biplane. It has a maximum speed of 105 m.p.h. and a minimum speed of 48 m.p.h. In addition to the usual equipment, the pilots are carrying a pneumatic mattress, 6 galls. of drinking water, night-flying instruments and flares, two compasses, a Reed turn and bank indicator, a spare propeller and spare wheel; and 500 galls. of petrol, equivalent to 25 hours' flying, are being carried in two wing tanks and a tank in the fuselage, the fuel and oil being Shell.

The flight is scheduled to start shortly, probably at the beginning of March.

# The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

REPORT of Meeting of the Committee held on February 13, 1929.

**Present.**—Lieut.-Col. Sir Francis K. McClean, A.F.C., in the Chair; Air Vice-Marshal Sir W. Sefton Brancker, K.C.B., A.F.C.; Griffith Brewer; Capt. R. J. Goodman Crouch; Lieut.-Col. M. O. Darby, O.B.E.; Lieut.-Col. John D. Dunville, C.B.E.; Lieut.-Col. J. T. C. Moore-Brabazon, M.C., M.P.; Major H. A. Petre, D.S.O., M.C.; Capt. C. B. Wilson, M.C.; H. E. Perrin, Secretary.

**Elections.**—The following new Members were elected:—

Cyril Alexander Knust.  
Capt. Archibald Charles Lutyens.  
Leslie Mitchell Macpherson.  
Flying Officer Albert Leslie Ottway.  
William Albert Redverse Pepper.  
Reginald Clarence Presland.  
Harold George Romer.  
Arthur Frederick Sidgreaves.  
Stephen Christopher Winfield Smith.  
Dr. Alan R. Snowdon.  
Clarence Stewart Thom.  
William Hutcheon Watt.

**Aviators' Certificates.**—The following Aviators' Certificates were granted:—

- 8495. George Hamilton Oswald, Hampshire A.C.
- 8496. Carl Richard Borkland, R.A.F. Graduation Certificate.
- 8497. John Scott-Taggart, London A.C.
- 8498. Carill Stanley Napier, De Havilland F.S.
- 8499. John Charles Garner, Lancashire A.C.
- 8500. Edward Holmes Williamson, Liverpool & District A.C.
- 8501. Alfred Christian Jonassen, Henderson F.S.
- 8502. George Pengeley Kerr, Brooklands F.S.
- 8503. Lawrence Swan, Henderson F.S.

**Committee Reports.**—The reports of the following Sub-Committees were received and adopted:—Royal Aero Club and Society of British Aircraft Constructors Joint Standing Committee, The House Committee, The Finance Committee, Schneider Trophy 1929 Committee.

**Appointment of Official Timekeepers.**—The following Official Timekeepers were appointed for the year 1929:—F. T. Bidlake, J. H. Burley, T. D. Dutton, A. V. Ebbelwhite, H. N. Ellis, A. Fattorini, Frank A. Fattorini, Col. F. Lindsay Lloyd, C.M.G., C.B.E., Maj. A. H. Loughborough, A. G. Reynolds, R. G. Spikins.

**Lord Gorell Committee on Early Flights.**—The report of the Lord Gorell Committee on Early Flights was presented, and it was decided that the complete report should be published.

A unanimous vote of thanks was passed to Lord Gorell, the Chairman, Capt. G. de Havilland and Lieut.-Col. W. Lockwood Marsh for their very valuable services on this Committee.

**N.B.**—A complete copy of the report is published in this issue of FLIGHT.

## SCHNEIDER CONTEST, 1929

A CONFERENCE between the Royal Aero Club and Municipal, Railway, Harbour Board, Shipping, Admiralty, and Air Ministry Officials was held at the Royal Air Force Club on February 11, 1929.

His Grace the Duke of Atholl, President of the Royal Aero Club, presided. The following were present:—Sir Philip A. G. D. Sassoon, Bart., G.B.E., C.M.G., M.P., Air

Vice-Marshal Sir Ivor L. B. Vesey, K.B.E., C.B., C.M.G., D.S.O., Air Vice-Marshal C. L. Lambe, C.B., C.M.G., D.S.O., representing the Air Ministry; Capt. C. F. Harris, R.N., representing the Admiralty; Comdr. G. E. Boulton, R.N. (Commander-in-Chief, Portsmouth); Maj.-Gen. the Right Hon. F. E. B. Seely, C.B., C.M.G., P.C., D.S.O. (Lord Lieutenant of Hampshire); the Right Hon. the Lord Mayor of Portsmouth (Alderman J. E. Smith) (Portsmouth and Southsea); the Town Clerk of Portsmouth (Mr. F. J. Sparks) (Portsmouth and Southsea); the Mayor of Southampton (Alderman M. H. Pugh) (Southampton); the Town Clerk of Ryde (Mr. F. J. Fawdry) and Alderman G. Mears (Ryde); Mr. C. E. Cotterell (Cunard Line); Mr. P. E. Curry (White Star Line); Capt. J. B. Whitton (Union-Castle Line); Mr. Harry Parsons (Southampton Harbour Board); Mr. G. R. Newcombe, Mr. F. H. Willis, and Mr. W. M. Perts (Southern Railway); Mr. A. Hodgkinson and Mr. R. E. Swain (Canadian Pacific); Mr. J. C. W. Damant (Cowes District Council and Cowes Harbour Commissioners); Sir Charles Wakefield, Bart.; Air Vice-Marshal Sir W. Sefton Brancker, K.C.B., A.F.C. (Director of Civil Aviation).

**Representing Royal Aero Club.**—Brig.-Gen. Lord Thomson, P.C., C.B.E., D.S.O. (Chairman, Royal Aero Club); Lieut.-Col. M. O'Gorman, C.B. (Vice-Chairman, Royal Aero Club); Lieut.-Col. M. O. Darby, O.B.E.; Capt. C. B. Wilson, M.C.; Capt. R. J. Goodman Crouch; Wing-Comdr. T. O'B. Hubbard, M.C., A.F.C.; Mr. E. J. B. How; Lieut.-Col. L. F. R. Fell; Maj. J. S. Buchanan, O.B.E.; Comdr. James Bird; Mr. R. H. S. Mealing; Sqdn.-Ldr. R. L. G. Marix, D.S.O.; Lieut.-Col. Sir Francis K. McClean, A.F.C.; H. E. Perrin (Secretary).

Lieut.-Col. M. O'Gorman made a general statement on the organisation of the contest, which, it was estimated, would cost between £15,000 and £20,000.

Sir Charles Wakefield, Bart., intimated that he would make a contribution of £5,000 towards the expenses.

The representatives of the various interests present agreed to consider the whole question with a view to ascertaining the ways and means by which their co-operation and support could be given.

REPORT OF MEETING OF ROYAL AERO CLUB AND SOCIETY OF BRITISH AIRCRAFT CONSTRUCTORS JOINT STANDING COMMITTEE, HELD JANUARY 31, 1929.

**Present.**—Royal Aero Club: Air Vice-Marshal Sir W. S. Brancker, K.C.B., A.F.C. (in the chair); Lieut.-Col. Sir Francis K. McClean, A.F.C.; Maj. R. H. Mayo, O.B.E.; Capt. C. B. Wilson, M.C.

**Society of British Aircraft Constructors:** H. Burroughes; H. T. Vane, C.B.E.; C. C. Walker.

**In attendance:** H. E. Perrin, Secretary, R.Ae.C.; J. T. Brown, Assistant Secretary, S.B.A.C.

**King's Cup Air Race.**—It was decided to recommend that the King's Cup Air Race should take place on Friday and Saturday, July 5 and 6, 1929, over approximately the same course as last year, the handicapping to be on known performance.

**International Aero Exhibition.**—It was decided to recommend that a rally of all clubs and private owners should be held during the period of the International Aero Exhibition, and that one day's racing should include the Grosvenor Cup and Siddeley Trophy.

The question of holding the rally and races at the new aerodrome at Heston was agreed to, subject to satisfactory arrangements being made.

Offices: THE ROYAL AERO CLUB,

3, CLIFFORD STREET, LONDON, W.1.

H. E. PERRIN, Secretary.

## The British Aero Show

OFFICIAL entries for the International Aero Exhibition to be held in July at Olympia, London, have been received from Germany and France for National Composite Exhibits. They will be arranged respectively by the German Union of Aircraft Constructors (Reichsverband der Deutschen Luftft.-Industrie) and the Chambre Syndicale des Industries Aeronautiques. Details of the exhibits have not yet been received. The Air Ministry will be responsible for the

British official exhibit and about 15,000 sq. ft. have been reserved for its use. The exhibit will comprise an A.I.D. Section (Aeronautical Inspection Directorate) showing the system of inspection applied under British Airworthiness procedure, an aeronautical medical section, an Air Survey section, and also a comprehensive range of models of all types of British Aircraft from the early pioneer days to the present time. An interesting British exhibit will be a 3-engined 4-seater Avro monoplane.





## THE DANIEL GUGGENHEIM FUND

### Second Report on the Activities for 1928

THE second report of the Daniel Guggenheim Fund for the promotion of aeronautics has just been issued, and the following is a brief summary of its contents.

Progress of commercial aviation in the past year, says the report, has exceeded every reasonable expectation. Probably the outstanding aeronautical achievement of 1928 was the demonstration in America by private enterprise that air transport can be made a profitable business without government subsidy.

The American pioneer air mail contractors, by their courage and business ability, have surprised the world by this quick and convincing demonstration. The air transportation services have been extended in number and route; output of aircraft has enormously increased and for the moment lags far behind the demand; and scientific research is approaching a solution of the few remaining aeronautical problems.

Perhaps there is no better indication of the popular confidence in aviation than the recent large scale investment of public capital in both air transport and aircraft manufacturing companies. This great public interest in aeronautical financing calls for a note of warning. In the present early stage of commercial aviation, as in every pioneering enterprise, though the lure of great gain is appealing, the risk of failure is comparatively great, and only those who can afford to take this risk should embark on these ventures. In addition, every new business development has its "wildcat" organisations; the only safeguard against loss in enterprises of this kind is complete knowledge of their work and assurance of the absolute integrity of those sponsoring it.

Pointing out that the growth of private aeronautic enterprise has necessarily changed the character of some of the Fund's work, lessening the importance of commercial assistance, the report continues: If the year has modified some of the activities of the Fund, it has greatly expanded the others, particularly in scientific research. This report mentions several new enterprises which may eventually continue of themselves—the first adequate weather-reporting service for American aviation, the first full-flight laboratory for fog-flying, the first National Safety Conference in Aeronautics. Among other projects of the Fund, the Safe Aircraft Competition approaches its culmination with an international list of competitors; and the Town Marking campaign, inaugurated last fall, is slowly establishing an adequate list of sign-posts for air transportation.

The last-named project has met with the enthusiastic co-operation of business. Already more than 400 towns have accomplished identification due to these efforts, in addition to those already identified. Similarly, the Safe Aircraft Competition has evoked widespread interest both here and abroad. Entrance application, so far, have been received from one manufacturer in Italy, five in England and six in the United States. The British entries include two well-known inventions for maintaining stability—the Handley-Page slotted wing and the Cierva Autogiro.

The weather reporting service which was installed by the Fund on the airways between Los Angeles and San Francisco in June, 1928, has proved to be an unquestioned success and the demand placed upon it has made it necessary to expand

it considerably, to 40 observation points making reports six times daily.

The success of this system gives an indication of what can be done for trans-oceanic airship travel. A network of weather-reporting stations at sea could be established by the simple expedient of extending present-day international co-operation so as to obtain radio reports from all ships afloat. These reports would be sent to a central station where they would be available to all navigators. The system would be supplemented by the existing weather service ashore and additional terminal stations on the mainland, according to the location of the routes. The flight of the Graf Zeppelin last fall would have been very greatly facilitated if adequate weather information had been available, and would have enabled the airship to avoid the squall that partially disabled it in mid-ocean and retarded its passage.

The fund has continued to finance research in other institutions. Its appropriations to six large universities amount to a total of about \$1,200,000, in addition to a considerable number of smaller appropriations for specific purposes. This work in the universities has been balanced by the fund's Committee on Elementary and Secondary Aeronautic Education which is assisting in the introduction of a study of aeronautics in the schools and in the preparation of text books and courses.

The report concludes with a plea for wise governmental regulation and indirect assistance to aviation. It states: "Three years ago, before the passage of the Air Commerce Act, the United States Government had not officially recognised commercial aviation, and its development lagged far behind that in some of the countries of Europe. Still one encounters the misconception that this backward condition continues. Nothing could be farther from the truth. To-day commercial aviation in America, measured in terms of aircraft factories and commercial and civil airplanes in operation, very greatly exceeds the aggregate of the rest of the world. The one phase of commercial aeronautical development in which America still ranks after other countries is that of passenger-carrying. But such passenger services as are now in operation and those in process of development indicate that America will soon take a leading position in this phase of aviation as well.

"All these developments have taken place in the typically American manner of private enterprise. They have only been made possible, however, by wise governmental regulation and indirect assistance. With the tremendous expansion in commercial aviation in America, there is a constantly growing need for further assistance of this kind, as represented in airports, airways, weather services and adequate uniform legislation. Commercial air transport has reached its present comparatively satisfactory state without the hundreds of millions of dollars that the railroads enjoyed from Federal and State aid in their pioneering days, and without the hundreds of millions of acres of lands granted to them. Indirect governmental assistance is an absolute essential for the full development of commercial aviation, and calls for the co-operation of federal, state and municipal governments."

#### The B.B.C. and Flying

COMMENCING on March 7 next, the British Broadcasting Corporation are introducing a series of weekly talks on "How an Aeroplane Flies." These talks will be given on Thursdays, at 7.25-7.45 p.m., by Dr. Ivor B. Hart, who is one of the Education Officers of the Air Ministry. A synopsis of these talks—which will also be published in the *Listener*—is as follows:—

March 7.—*General Introduction.* Man's age-long yearning for the conquest of the air. Lessons from the early attempts. The Saracen of Constantinople. The understanding of how an aeroplane flies involves an appreciation of some simple facts of mechanism. A short discussion on force and its effects.

March 14.—*Forgetting for the moment that the aeroplane is made up of a lot of bits and pieces, and thinking of it only as a single plane surface—an aerofoil.* How swift motion of an aerofoil through the air produces an upwards-lifting force. Why the angle of an aerofoil is inclined to the direction of motion, and why its surface is cambered or curved.

March 21.—*The Meaning of "Lift and Drag."* Lift is

opposed by gravity and keeps the machine in the air. Drag is overcome by the thrust of the propeller shaft of the engine. The distinction between active and passive drag. How the drag is affected by the speed. How it influences the design of the machine. The importance of the lift-drag ratio.

March 28.—*How we get from the Aerofoil to the Aeroplane.* The meaning of efficiency. The effect of the amount of wing surface. Aspect ratio and its meaning. Putting on an extra wing to make a biplane. Why the upper wing is "staggered." The difficulty of reconciling climbing power with speed. How the elevator helps.

April 4.—*The Meaning of Stability.*—Why it is important for the aeroplane. The three kinds of stability. Directional stability, the tendency for the machine to keep its course. Lateral stability, the tendency to keep the machine on an even keel, without which it would roll sideways. Longitudinal stability, the tendency to keep it from pitching and tossing. How these are helped by keel surface, dihedral angle, and by fitting rudder, elevator, and tail plane.

April 11.—*Manoeuvre and Control.*—A typical run. Taking off climbing. Maintenance of horizontal flight. Banking on a turn. Gliding. Landing.



# EDDIES

GREAT Scott! Another great—and the greatest yet—merit attaching to aviation was the momentary thrill which I experienced when my eyes lighted upon "The Plane Man's Pathway to Heaven." And then came the awakening and crash to earth. This suggestive opening to the one desired great end was just the title of an ancient tome dating back to 1601, which has been found in a Cheshire cottage, one of two books which are said to have been the only marriage portion which John Bunyan's wife brought to him.

NINE millions of neurons go to constitute the brain—presumably of average intellect—according to Sir Robert Armstrong-Jones, when he dealt last week with the brain and nervous system during a lecture for the People's League of Health. Very excellent advice was forthcoming upon this occasion and, however the ordinary human may regard his brain as over taxed, it is to the air pilot that Sir Robert assigns the most exacting use of the mind. He referred to the rigid examination which is demanded, with the necessary many rejections, before acceptance as a candidate. This duty and occupation demanded an almost perfect and quick nervous system, for air safety depended, he said, much on the sense of vibratory stimuli, and the sense of static equilibrium of the body. So now we know.

Is it possible that the recently discovered wonderful silencing properties of seaweed from Nova Scotia, as so successfully installed at the Midland Bank new City headquarters, may lead to the solution of deadening, or even eliminating, engine noise in aircraft? Great results have already been achieved under the direction of Capt. A. G. Huntley, the originator of this form of noise-absorbing covering, in hospitals, schools, court houses, and other buildings where quietness is an essential. Capt. Huntley, who is now associated with the sound-locators of the London Territorial Air Defence Brigades, might well try out his discovery a step further in the direction of sound-proof aircraft cabins. It is a fascinating prospect, when it is realised that, when behind glass doors, by this method motor omnibuses, lorries, horse traffic and what not are seen to be whizzing past in the street, but never a sound reaches the inside of the room. And, moreover, even the internal noises of buzzing conversation, typewriting, etc., are materially deadened at the same time. Yes, there should be hope in this development for neutralising one of the great drawbacks to air travel.

AN attempt to fly round the world in a "non-stop" flight of five days next July is credited to Major Goebel from New York, who was the winner of the Dole Prize for the California-Honolulu flight. The idea is to re-fuel in the air *a la* "Question Mark." A matter of fourteen machines are to be built as re-fuelling "stations," two for each of seven points, where it is proposed petrol should be taken *en route*. The machine is to be an amphibian with a relief pilot and navigator. Which all sounds interesting as a "stunt," but hardly helpful from the commercial or ordinary private user's standpoint.

No wonder there were cheers in Parliament last week when Sir A. Chamberlain referred to the rescue from Kabul of some 366 humans by the R.A.F., of which 280 were women and children, the nationalities embracing, besides British subjects, Afghans, French, Germans, Italians, Persians, Roumanians, Swiss, Syrians, Turks, and the United States of America.

WHAT a commentary upon a nickname misnomer must be the rapid rise of Colonel Lindbergh—the Flying Fool—as most of his friends dubbed him before they had an inkling that he proposed to fly the Atlantic. Here we have him now, not only the betrothed of the daughter of an immensely rich man, the United States Ambassador to Mexico, but he is reported as being the possessor of a solid fortune, with prospects of becoming one of the chief magnates of the United States Commercial Air Transport, now being organised on such a gigantic scale. A flying fool indeed! Moreover, his matrimonial example apparently has spread to his mother, whose fiancé is announced as Captain Anderson, of the liner *President Wilson*. It should be a happy idea that mother and son should participate in a double wedding.

SWITZERLAND is becoming quite conspicuous in its effort to have aerodromes here, there and everywhere in suitable

spots, evidently being alive to the huge following which their provision will ultimately attract. Many of the most popular towns, such as Zurich, Basle, Geneva, Lausanne and others, already have their flying grounds, and the question has now arisen as to why Berne, the capital of Switzerland, should exist without a similar project. At the same time it has been suggested that the Swiss are rather over-doing their efforts in this direction. But surely it must be wrong to suggest that being possible. Rather the reverse. Our friends should be hailed, as they are in so many other directions, as being very far-sighted.

ANOTHER injustice to the farming interests, which are on all sides being reported to be in such an extremely bad way. It seems as if even science is now ranged against them, when we read in the official report on Air Services Appropriation Accounts of quite a vogue for "milking" aeroplanes. What next?

ANOTHER glimmer of hope is emerging through the Rip Van Winkle attitude of the Post Office Circumlocution Office, as last week Viscount Wolmer, the Assistant Postmaster-General, admitted that the question of marking the inauguration, in April, of the air service to India by the issue of special stamps or a special air mail envelope, was receiving consideration. When it materialises, what a job the local dustman will have sweeping up the accumulated cobwebs.

SIR SIDNEY LOW, in a *Sunday Pictorial* article, emphasising our having given our rivals abroad a flying start in aviation development, which it may be very difficult to make up, draws special attention to unofficial flyers who have blazed the trail, mentioning Sir Alan Cobham's great African seaplane flight, and proceeds then to eulogise another great flyer—an airwoman this time, to wit, Lady Bailey, who, in her small "Moth," made her wonderful African flight, Sir Sidney adding that "after her magnificent display of feminine courage, judgment and endurance, came home with words of warning on her lips. She has pointed out that everywhere, after passing the Zambesi, she was dependent on the aid so courteously rendered her at French and Belgian air stations. She was bound to take advantage of this friendly assistance, because there were no British installations and no British air services throughout the whole interior of the continent! Meanwhile France and Belgium are linking up their settlements and planting their air stations; and Lady Bailey tells us that if we do not bestir ourselves quickly inter-African air transport will become a Franco-Belgian monopoly.

Perhaps we shall bestir ourselves in time. The Secretary for Air said in Parliament last week that Imperial Airways will be operating a regular service between London and Alexandria by about April 1, and that he is 'already considering' proposals for a line from Egypt to the Cape."

On looking through the "adverts" in my wireless paper the other day a picture of an aeroplane caught my eagle, or flying eye. I recognised it at once as purporting to be the Beardmore "Inflexible," and then, nosing to see what was its connection with wireless, I landed—with some strain to my shock-absorbers—on the following priceless wording: "When this huge monoplane first streamed, roaring through the air, climbing, banking, diving, looping, its safety seemed a miracle—a favour from the gods. Yet it was not. It was the final compliment to man's toil, to the months of care expended on it, to the brains that designed it, to the accuracy and precision lavished on its construction." Then followed particulars of a wireless component, upon which, apparently, the same precision, etc., had been lavished.

WELL, I am glad to hear of—and would just love to see—the looping qualities of this Beardmore "light plane."

A WORK of vast personal interest is "Seven Weeks on An Ice Floe," by Professor Franz Behounek, of Prague, who was one of the Nobile expedition in his scientific capacity. The photographs are a great feature of importance, and, taken on the whole, the author, who is an enthusiastic believer in Arctic exploration, appears to have set out to vindicate General Nobile as the leader of the ill-fated expedition. At least the details of happenings should be helpful to a true perspective being ultimately reached.

AEOLUS

## "Greatest Achievement in Aviation"!

*Aeroplane* : 16.1.29

**T**HE Four Supermarine 'Southampton' flying boats, each fitted with two Napier Lion engines, covered a total distance during the flight of about 22,600 statute miles. As the same aircraft and the same engines were used throughout the cruise, this mileage is eloquent testimony to the quality of British aircraft and aero engines.

In his covering report, the Commander states that neither aircraft nor engines have given any trouble of any consequence, and—

**have caused no forced landings.**

108,000 machine miles without a single forced landing represents—

**a record of reliability of which  
Great Britain has cause to be  
proud.**

The total flying time of the cruise since leaving England has been 284 hours 35 minutes, which means, of course, that each of the eight Napier Lion engines has run for that length of time, and between them—

**the eight engines have totalled  
some 2,276 hours,**

a sufficient length of time to have given a less reliable engine many opportunities for 'going on strike.' Yet the entire absence of forced landings proves that, as usual, the 'Lions' kept roaring as long as they were being properly fed."

*Flight* : 17.1.29

# NAPIER

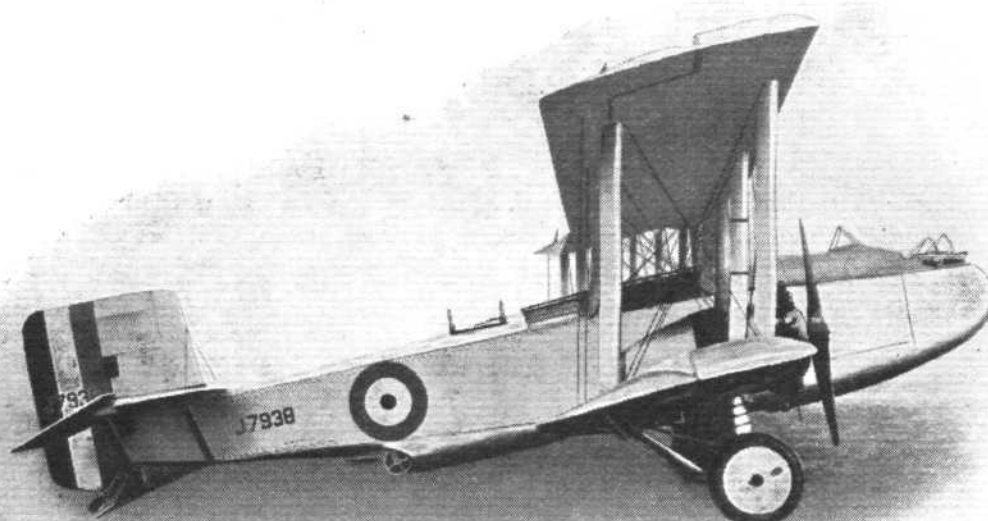
*The finest aero engine in the World*

D. NAPIER & SON LTD.  
ACTON · LONDON · W 3

*Save time by using the Air Mail.*



The Boulton & Paul "Partridge" single-seater fighter of all-metal construction.



Boulton & Paul All-Metal "Sidestrand" Day Bomber. Chosen recently after exhaustive tests as a Royal Air Force Service Machine.

# BOULTON & PAUL LTD

## NORWICH

Telegrams:  
"Boulton, Norwich."

Telephone:  
Norwich 851 (5 lines).

LONDON OFFICE: 139, Queen Victoria Street, E.C.4.  
Telegrams: "Boutique, Cent. London." Telephone: Central 4642.

Kindly mention "Flight" when corresponding with advertisers.



# PRIVATE



# FLYING

A Section of FLIGHT in the Interests of the Private Owner, Owner-Pilot, and Club Member

## FLYING AS A PROFESSION

THERE is evidence of a very wide ambition amongst the young men of this country to enter civil aviation, preferably as pilots. A crucial moment in a young man's life is his arrival at an age when he must start a career. In professions and industries which are old established there is little difficulty, but in those that are struggling in the early stages there is great difficulty. He cannot profitably delay his start, yet new industries are not always ready for him. He is then faced with the problem of abandoning his ambition or hanging on for a delayed start.

It is possible that a survey of the position of commercial air pilots in this country today may enlighten many of these ambitious young men.

### Air Line Pilots

Logically, we must commence with Imperial Airways, Ltd., for they are the largest individual employers of commercial pilots in the country. There are 26 pilots on their present staff, who are engaged on all the services operated by the company. The Middle East services, stretching between Cairo and Basra, absorb five, and included in the remaining 21 are those to be selected for the London-India service which starts at the end of this March. The others, the larger number, operate the Continental air lines, carry out special flights, or are loaned to people who want to undertake private air journeys.

The standard and experience required of an applicant for a pilot's position in the company is essentially very high, which has been justified by the record for safety and reliability created since the inauguration of the services. He is expected to have a record of about 1,000 hours' flying on various types of aircraft, which has included cross-country and night flying; possess already a second-class navigator's certificate, and also the "B" licence, which allows him to carry passengers. Experience with multi-engine types of machines and at practical engineering also is preferred.

A knowledge of languages is an obvious asset, for an air line pilot's career is spent as much abroad as in England, whilst some previous business training is desired.

A man who has "knocked about a bit," to quote a mentioned phrase, is also favoured. There are no rigid age limits fixed, but there are, of course, natural boundaries. Obviously, it is no use a youth of nineteen to twenty thinking he is suitable, because he has not had time to acquire the necessary experience. An age between twenty-five and thirty is preferred.

When engaged, a new pilot is treated as a probationer for six months, during which time he passes through all phases of an air line pilot's work. He flies as second pilot to all the company's senior pilots in turn to study their particular skill in all its necessary applications, familiarize himself with the routes and varying weather conditions. This training is unique in its standard, for his masters are the most experienced commercial pilots in the world, men who have been flying continuously on air lines since the war, and who had long war service in the air. Many of them, therefore, have a continuous record of fifteen or more years' flying.

The standard, which expresses itself, raises the barriers to the young man who wishes to enter civil aviation without previous experience to seek a niche as a commercial pilot on our limited air lines as they are today. He may learn to fly at a club or school and obtain his "B" licence, but that valid introduction card cannot force him through the experience that a Royal Air Force pilot can usher in. Even a pilot with 1,000 hours' flying time cannot always be obtained, at the required moment, but there are always R.A.F. pilots, overwhelmingly qualified in other respects, leaving the service and eager to continue their profession in the commercial spheres.

The civilian young man has no opportunity of familiarizing himself with multi-engined aircraft, to mention one obstacle, and unless he owns a machine it is going to take a prolonged period before he attains anywhere near 1,000 hours. Yet there is always a loophole in the strongest fort, and there is no exception in the case of Imperial Airways. They employ flight engineers, men who pass through the shops and graduate to an engineer's position on the air liners.

Naturally they get an excellent chance of assimilating that



**A USEFUL PAIR :** Miss Winifred Brown finds that her Armstrong-Siddeley Car makes a very convenient combination with her Avro "Avian" (Cirrus) light aeroplane. This Lancashire airwoman is as skilful a hockey player as she is motorist and air pilot, and in the North Country she is well known in hockey circles. Miss Brown qualified as a pilot with the Lancashire Aero Club, and has been a private owner for a considerable time.

knowledge acquired by the probationer pilot, and no doubt much more thoroughly, for they have a wider opportunity than six months allows. Some of the present engineering staff have done between 2,000 and 3,000 hours' flying and become, virtually, capable pilots, although not employed as such on that accomplishment alone. But Imperial Airways, Ltd., realise their value in the higher scale, and therefore if they like to learn to fly, say at a club or school, and gain the "B" licence, then they stand a fair chance of being engaged as pilots by the company. Two flight engineers have already succeeded in this way.

This suggests then that the young man with a "B" licence might achieve his ambition through the engineers' shops of Imperial Airways, Ltd. Their pilots come under the control of Maj. H. G. Brackley, D.S.O., D.S.C.

#### Flying Instructors

Collectively, the flying clubs absorb more pilots than Imperial Airways, Ltd. There are fourteen active clubs and most of them have a chief instructor and an assistant instructor, so that at least twenty-eight positions are regularly occupied. Again we find that ex-R.A.F. officers hold the field by virtue of their standard and experience. Some of them have resigned their Service commissions to take up these civil appointments. Amongst their assistants, however, there are some who had no previous air career, either in the Air Force or in civil aviation. They were members of a club, learned to fly and obtained the "B" licence, and because they showed exceptional ability they were appointed as assistants, and with satisfactory results.

Vacancies in the clubs do not occur so rarely as one might imagine in such a small field. Some of the clubs have had quite a few changes in instructors since the beginning of the club movement. Last year Canada attracted at least three of our senior club instructors and also gave a chance to a prominent club member pilot. The Dominion expressed a direct preference for English pilots at the time, and subsequent reports suggest that until recently, at least, there was still wide opportunity for the pilot there. He must have a record of something like 2,000 hours, one believes, for the responsible posts.

#### Test Pilots

The market for our aircraft indirectly dictates who should fill the small number of test pilots' jobs. As most aircraft manufacturers produce for the Royal Air Force the test pilots in the Service know more about their machines than anyone. Consequently, when a manufacturer requires a test pilot he is almost certain to find one in the Service who has been testing his particular machines for some time. The man is therefore simply born for the job.

A glance at the position here\* today shows that nearly every civilian test pilot was previously prominent in the same capacity in the Service. There is usually one on the staff of each manufacturer, although the output of aircraft in recent years has made room for two in some cases. The total so employed today comes to about twenty. The subordinate posts have not all been filled in the same way as the higher posts. There is a casual parallel system to that mentioned with the clubs. Amongst the drawing office staffs, or other departments of aircraft firms, ex-pilots can always be found, eager to fit in flying duties with their more sedentary tasks.

Coming to other branches of aviation, there are possibly twenty instructors employed by aircraft manufacturers who operate R.A.F. Reserve training schools, of which there are now four. These are situated at Stag Lane, Edgware, Middlesex, Brough Aerodrome, E. Yorks, Filton Aerodrome, Bristol, and at Whitley Aerodrome, Coventry. A seaplane instructor is employed at Brough.

For his skywriting business, Major J. Savage, of Hendon

Aerodrome, employs ten pilots. The experience of a pilot who would seek to enter his service must include a flying time of between 1,500 and 2,000 hours. There are two interesting exceptions at the moment. For his Central Europe air contracts, he has engaged two young German pilots who were trained by the German State. This State training lasts for two years and it produces pilots of such competence, owing to the thoroughness and variety of the experience made possible, that they are fully qualified for pilots' positions on the German air lines. The two young pilots working for Major Savage were on the verge of entering the Luft Hansa service when they were kindly transferred to him by Luft Hansa.

#### Air Survey

Air survey has wide prospects and English companies are establishing themselves throughout the world. The Aircraft Operating Co., Ltd., who have been carrying out large contracts in various parts of the world, now employ six pilots and have two others in training. Air survey is a highly specialised task and it holds no future for the mere air pilot. The proportion of flying required, for a large survey, to the preparation of the photographs and maps, etc., is so small as to be almost incidental. For instance, during a year's work not more than three months are spent in flying. Therefore, if a pilot could do nothing more than fly he would only be required temporarily.

The Aircraft Operating Co., Ltd., prefer a pilot with 500 to 1,000 hours' flying time, but far more important is a degree in engineering or survey. Without that, in fact, or without some authentic training in either of those two sciences, the mere pilot is not suitable. He is of more use with a degree in either of those subjects and small flying experience than with 1,000 hours and nothing else. One is informed authoritatively that there are good positions to be made in this profession.

The Air Survey Co., Ltd., employ three pilots, and their directors also fly. Their contracts for air survey have been done in Egypt and India, etc.

Now we must not forget that joy-riding and air-taxi companies employ, collectively, a body of pilots approximately as large as the other branches of the industry do. Figures are not available at the moment, but one can estimate a total of about twenty pilots active at this work during the flying season. Some of the first club instructors were former joy-riding pilots.

#### Future Opportunities

As regards coming developments, a comparatively wide opportunity will arise in the near future when National Flying Services, Ltd., commence their flying programme. They will require sixty pilots for instructional flying and air-taxi work. Those pilots who are qualified instructors, and others who have had much experience of cross-country flying, are invited to write to the company now, giving full particulars of their careers, including recent flying activities. They will not be engaged immediately, but when the company is considering the matter, they will have at hand a list of suitable applicants from which a selection can be made. It is emphasised that an experience of cross-country flying is most essential for reliable air-taxi work. The address of the company is Dorland House, 14, Regent Street, S.W.1. To summarise our analysis of the prevailing conditions in the aviation industry for pilots, we find that roughly one hundred and forty pilots are engaged in its various channels, and we have also seen that the future pilot will be raised to an important status by the knowledge that is going to be required of him besides his skill with the controls. One can, perhaps, suggest that, failing the possibility of a young man approaching the industry with full qualifications as a pilot, he should get in the profession as anything, for, after all, it is usually those who are already in the swim who are able to keep swimming.

#### Northampton Objects

NORTHAMPTON TOWN Council has decided to present a petition to Parliament against the London Midland and Scottish Railway Transport Bill, the chief objection being, it is said, the establishment of aerodromes without municipal sanction as to the site.

#### Wolverhampton Air Enthusiasm

A LIGHT aeroplane club is proposed in Wolverhampton, and a meeting was arranged recently with the Mayor (Alderman A. E. Wood) presiding.

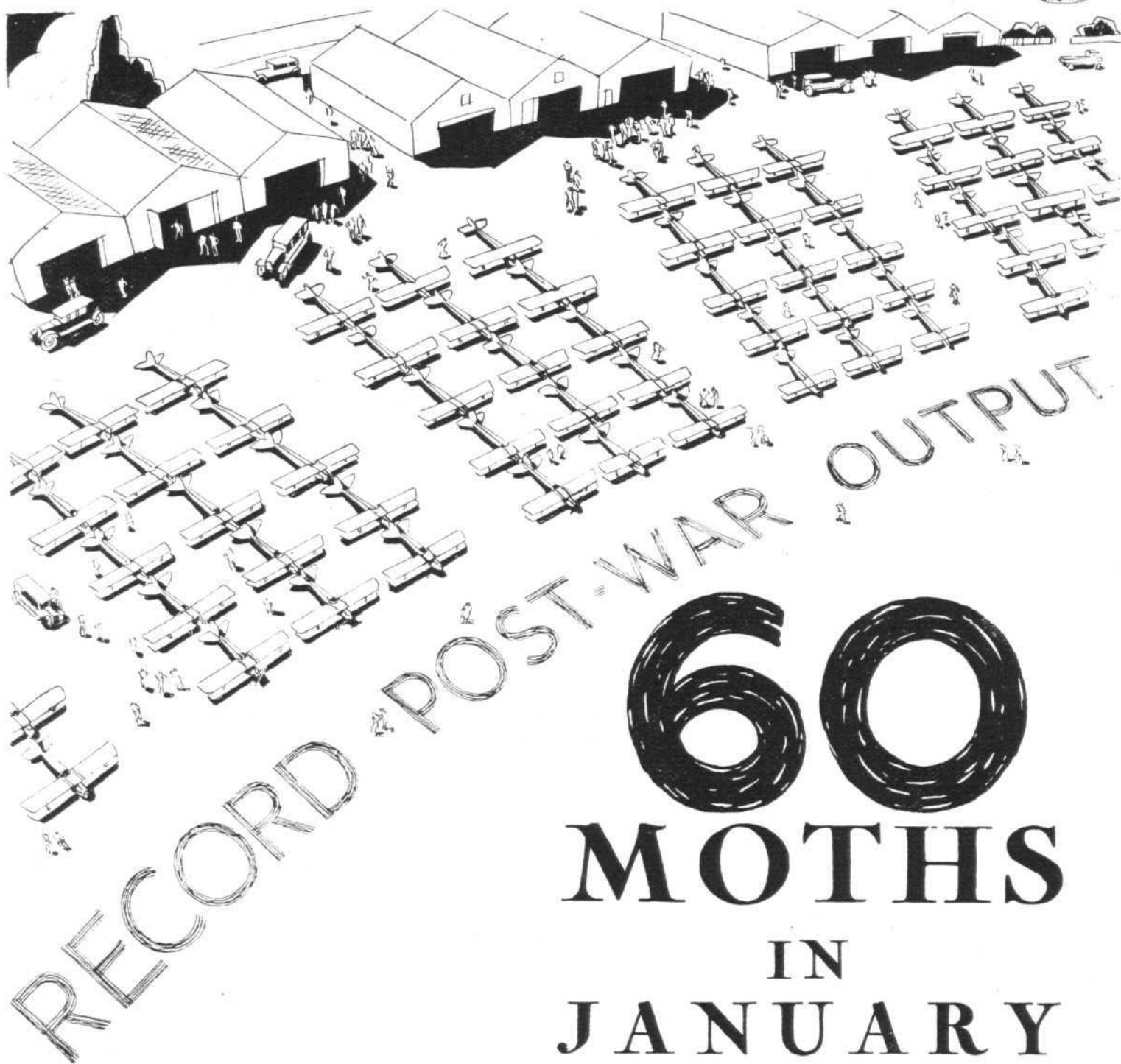
#### Cinque Ports Easter Meeting

THE Competition Rules and Flying Regulations for the Flying meeting to be held at Lympne on March 29 and 30, organised by the Cinque Ports Flying Club, have just been

issued, and a copy of these may be obtained by anyone interested on application to the Hon. Secretary of the Club, R. Dallas Brett, 114, High Street, Hythe, Kent. The programme of events arranged for this meeting will include the following competitions: (1) "Alight at Lympne," open to any aircraft, the winner being the pilot of the aircraft who crosses the finishing at Lympne aerodrome nearest to 12.30 p.m. on March 29. (2) "Manufacturers' Scratch Race," open to any 2-seater aeroplane with an engine not exceeding 5,000 c.c. total capacity, over a course of about 46 miles. (3) "Cinque Ports Handicap," open to any private owner flying his or her own machine fitted with any one of three types of engines forming the following three classes (a) "Cirrus I" (b) "Cirrus II" or "Genet"; (c) "Cirrus III" or "Gipsy." Course about 37 miles.



FEBRUARY 21, 1929



# 60 MOTHS IN JANUARY

The demand which calls for production on such a scale is the outcome of the Moth's sound design and excellent performance, allied to its record of un-failing reliability maintained during the past four years. These sixty Moths have been despatched to Dominion and Foreign Powers for training purposes, to Flying Clubs and Schools for tuition and club flying, and to private owners, in various parts of the world, including Australia, Canada, India, China, Chile, Singapore, Finland, Mexico, New Zealand, etc.

IN WORLD-WIDE USE  
WITH WORLD-WIDE SERVICE

THE DE HAVILLAND AIRCRAFT COMPANY  
LIMITED

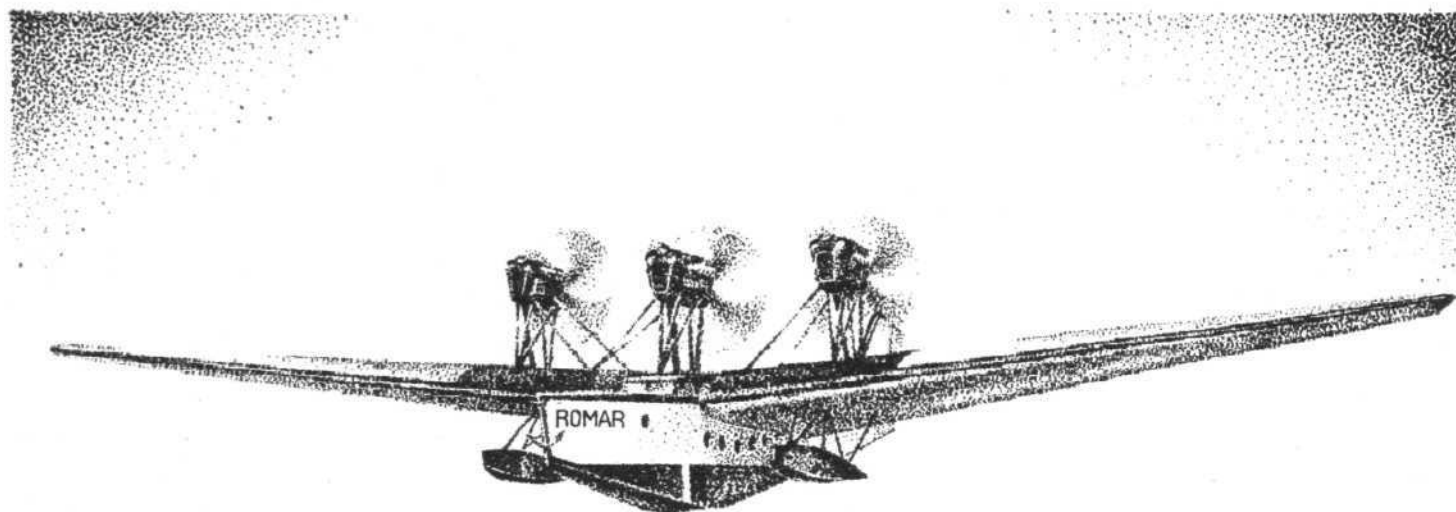
Stag Lane Aerodrome, Edgware, Middlesex.  
Telegrams: Havilland, Phone, London. Telephone: Colindale 6160/6163.

Branches and Agents Throughout the World

Streets

Save time by using the Air Mail.





# ROHRBACH

ROHRBACH METALL-FLUGZEUGBAU G.M.B.H.  
BERLIN, N. 65.

## THE SECOND ROTTERDAM MEETING

### International Light 'Plane Competition on June 27-30

THE competition for light aeroplanes held at the Waalhaven aerodrome, Rotterdam, last year, and won by Lady Heath in a "Cirrus-Moth," was a great success. Owing to the clashing of the dates of this competition and the race in England for the King's Cup, there were comparatively few British competitors, but those who did go vowed that they would return next year and bring a lot of friends with them. They will have the opportunity in June of this year, when the second international light 'plane meeting will be held at the same place. The days fixed for this year's competition are June 27, 28, 29 and 30, and in general the rules and regulations are similar to those of last year. There is no entrance fee, but entries should be sent to the Secretary of the Rotterdamsche Aero Club, Veerдам 1, Rotterdam, before June 20. The competition is for two-seater machines with a tare weight not exceeding 450 kg. (990 lbs.), and single-seaters with a tare weight not exceeding 350 kg. (770 lbs.). The two-seaters are required to carry a load of at least 180 kg. (396 lbs.), made up of two people weighing 80 kg. each, and 20 kg. of luggage. For the single-seaters the figures are 80 kg. for the pilot and 10 kg. of luggage, giving a total load of 90 kg.

#### Nature of the Competition

The actual meeting includes a rally, a relay race, and the main competition, which latter is again divided into a take-off test, a landing test, a speed trial, an altitude test and a cross-country flight.

**The Rally.**—In this, competitors leave from a recognised aerodrome (the departure being certified by the aerodrome manager), and fly to Waalhaven aerodrome without landing *en route*. The shortest distance which will be accepted is 200 km. (124 miles), and the distance covered will be reckoned in a straight line from the point of departure to the Waalhaven aerodrome. "Zero hour" has been fixed at 16 o'clock, *Amsterdam Summer Time*.

First prize (Fl. 125) will be awarded to the competitor with the smallest quotient in the formula  $\frac{S \cdot T}{D}$ , in which S is the number of minutes after 16 o'clock at which the competitor lands at Waalhaven, T is the time taken, in hours, for the flight to Waalhaven, and D is the distance covered between the point of departure and Waalhaven. This distance is expressed in kilometres.

In the *Relay Race*, which will be held later, machines will be divided into groups of three machines each, care being taken to see that, as far as possible, the groups are evenly matched. The "estafette" is carried first by one machine of each group, handed over to the second machine of each group, and, finally, flown over a circuit by No. 3 machines, the team whose No. 3 machine first crosses the finishing line being the winner.

#### The Main Competition

**Take-off Tests.**—This is divided into two parts. First the length of run to take-off is measured. Competitors start with a maximum number of points of 50. For each metre beyond 50 m. in the take-off, one point is subtracted from the 50. In part two of this test machines make a start from a point 1.5 times the length of the run scored in part one, and must clear an obstacle 3 m. (10 ft.) high. Any machine which does this scores 20 points.

**Landing Tests.**—In this test machines land over a barrier 2 m. high (6.56 ft.), and come to rest in shortest possible distance. The maximum number of points given is 60, and from this will be deducted half a point for every metre beyond 50 m.

**The Speed Trial.**—This will be held over a triangular course of about 20 km. (12.5 miles) in length. For this test only the useful load of the machines is reduced, the two-seaters carrying 60 kg. (132 lbs.) instead of the passenger, the useful load being reduced to a total of 160 kg. (352 lbs.). For the single-seaters the load is reduced to 85 kg. (187 lbs.). The maximum number of points awarded in this test is 60. If T' is the time of the winner, T'' the time of the second, and T''' the time of the third, the winner will be awarded 60

points, the second man  $60 \times \frac{T'}{T''}$ , the third man  $60 \times \frac{T'}{T'''}$ , and so on.

**Altitude Test.**—This consists in reaching a height of 1,500 m. (4,920 ft.) in the shortest possible time. In this test full load is again carried. Maximum number of points 30. If T' is time of winner, T'' time of second man, T''' time of third man, the winner will receive 30 points, the second man  $30 \times \frac{T'}{T''}$ , the third  $30 \times \frac{T'}{T'''}$ , and so on.

**The Cross-Country Test.**—This is mainly in the nature of a reliability trial, no points being awarded for speed. The test will be flown over a circuit of about 250 km. (155 miles), and compulsory stops of 15 minutes' duration have to be made at two aerodromes *en route*. Any landings made at other places will be penalised by 30 points. Every competitor covering the circuit within 4 hours will receive 30 points.

The final classification in the Second Rotterdam International Light 'Plane Meeting will be by the addition of the points scored in the various tests.

Although everyone is welcomed, the Rotterdamsche Aero Club is especially anxious to see the private owner well represented, and from personal experience last year we can assure them that they will one and all have a thoroughly enjoyable time. For further particulars, write to Secretary, R.A.C., Veerдам 1, Rotterdam.



Visibility : This view of the de Havilland "Hawk Moth" shows Capt. de Havilland in the pilot's seat, and indicates how good is the view from there. Note also the wide-track undercarriage.

["FLIGHT" Photograph]





# LIGHT 'PLANE CLUBS

**London Aeroplane Club**, Stag Lane, Edgware. Sec., H. E. Perrin, 3, Clifford Street, London, W.1.

**Bristol and Wessex Aeroplane Club**, Filton, Gloucester. Secretary, Major G. S. Cooper, Filton Aerodrome, Patchway.

**Cinque Ports Flying Club**, Lympne, Hythe. Hon. Secretary, R. Dallas Brett, 114, High Street, Hythe, Kent.

**Hampshire Aero Club**, Hamble, Southampton. Secretary, H. J. Harrington, Hamble, Southampton.

**Lancashire Aero Club**, Woodford, Lancs. Secretary, Mr. Atherton, Avro Aerodrome, Woodford.

**Liverpool and District Aero Club**, Hooton, Cheshire. Hon. Secretary, Capt. Ellis, Hooton Aerodrome.

**Midland Aero Club**, Castle Bromwich, Birmingham. Secretary, Major Gilbert Dennison, 22, Villa Road, Handsworth, Birmingham.

**Newcastle-on-Tyne Aero Club**, Cramlington, Northumberland. Secretary, J. T. Dodds, Cramlington Aerodrome, Northumberland.

**Norfolk and Norwich Aero Club**, Mousehold, Norwich. Secretary, G. McEwen, The Aerodrome, Mousehold, Norwich.

**Nottingham Aero Club**, Hucknall, Nottingham. Hon. Secretary, Cecil R. Sands, A.C.A., Imperial Buildings, Victoria St., Nottingham.

**The Scottish Flying Club**, 101, St. Vincent Street, Glasgow. Secretary, George Baldwin, Moorpark Aerodrome, Renfrew.

**Southern Aero Club**, Shoreham, Sussex. Secretary, Miss N. B. Birkett, Shoreham Aerodrome, Sussex.

**Suffolk Aeroplane Club**, Ipswich. Secretary, Maj. P. L. Holmes, The Aerodrome, Hadleigh, Suffolk.

**Yorkshire Aeroplane Club**, Sherburn-in-Elmet, Yorks. Secretary, Lieut.-Col. Walker, The Aerodrome, Sherburn-in-Elmet.

## LONDON AEROPLANE CLUB

REPORT for week ending February 17.—Pilot instructors: Captain V. H. Baker, M.C., A.F.C., Captain F. R. Matthews. Ground engineers: C. Humphreys and A. E. Mitchell. The following machines were in commission during the week:—G-AABL; G-EBXS; G-EBZC; G-EBMP.

Total flying time: 15 hrs. 10 mins. Dual instruction: 15 members received dual instruction during the week, the time being 7 hrs. 45 mins. Solo flying: 16 members flew solo during the week, the time being 7 hrs. 25 mins.

**CLUB AIRCRAFT**.—Mr. John Scott-Taggart, one of our members, has made a very generous offer to the Club. Realising that even during the winter months there is not a sufficient number of machines to cope with the membership, he rightly asks what will happen in the summer months. In order to meet the situation, Mr. Scott-Taggart has generously offered to provide a new aeroplane of the latest type, if at least one other well-wisher will do the same.

The Secretary is endeavouring to find ways and means of taking up this challenge and it is hoped all members will do their utmost to assist.

## BRISTOL & WESSEX AEROPLANE CLUB, LTD.

REPORT for the week ending Saturday, February 16.—Pilot Instructor, E. B. W. Bartlett. Ground engineer for the week, A. W. Webb. Machines in commission (2), YH, TV. Flying time for the week, 8 hrs. 20 mins. Pupils under instruction (6), 4 hrs. 45 mins.

"A" pilots (7), 2 hrs. 45 mins. Passengers (1), 10 mins. Test flights (8), 40 mins.

Our aerodrome has been covered with several inches of snow all this week. Pilots have been busy as far as has been possible, practising landing on snow with very good results. Mr. Downes-Shaw flew to Cowes and back, and further showed his determination. We had the worst of luck in the weather for our dance, as it chose that day to snow without ceasing. In spite of this, we had a goodly gathering, though we know that very many members and their friends living away were prevented from attending. Those present agreed that the evening had been a great success.

## CINQUE PORTS FLYING CLUB

REPORT for week ending Saturday, February 16.—Pilot Instructor, Major H. G. Travers, D.S.C. Ground engineer, Mr. R. H. Wynne. Machines, de H. Moth, RI and NN. Total flying time for week, 3 hrs. 20 mins. Dual instruction, Mr. Clementson, 15 mins. "A" pilots.—Mr. Crammond, 1 hr.; Mr. Douglas, 1 hr. 15 mins. Tests and joyrides, 6 hrs. 50 mins.

The arctic conditions prevented flying on Wednesday of this week, and on the other days the rival attractions of skating, etc., took away most of the members.

The Regulations for the Easter Flying Meeting have now been issued.

## HAMPSHIRE AEROPLANE CLUB

REPORT for week ending February 16.—Pilot instructors, Flt.-Lt. F. A. Swoffer and Mr. W. H. Dudley. Ground engineers, Mr. E. Lenny and Mr. J. Elliott. Aircraft, D.H. 60 Moth G-BOH. Flying time for the week, 6 hrs. 40 mins. Pupils under instruction (8), 4 hrs. 40 mins. Soloists (2), 40 mins. "A" pilots (1), 55 mins. Tests (5), 25 mins.

Our latest Vice-President, Lady Bailey, visited us on Sunday to collect her Moth. She was escorted part of the way by Mr. Fagan in OH, and Mr. Leech in the Avro Baby.

On Wednesday we were pleased to welcome at the club Major Clarence Young, the Director of Aeronautics of the Department of Commerce, Washington, U.S.A., who arrived here in the company of Capt. Goodman Crouch. We understand that the latter is highly thought of as a handicapper by all the successful entrants at last year's meetings.

Our flying has been sadly interfered with by the exceptionally wintry conditions of the last few days.

Two members successfully passed their figures of eight tests this week.

We very much regret to record the death of Sir James Nosker, of Bourne-mouth, our oldest associate member.

## LANCASHIRE AERO CLUB

REPORT for week ending February 16.—Machines in commission, MQ, XD, EC. Flying time, 19 hrs. 35 mins. Instruction (10), 5 hrs. 10 mins. Solo flights (17), 10 hrs. 30 mins. Passengers (12), 2 hrs. 45 mins. Tests (7), 1 hr. 10 mins.

Instruction (with Mr. Hall:—Davies, R. G., Slater, Serck, Foote, Garner, Stern, Williamson, Michelson, Sellers, Whitehouse; (with Mr. Cantrill): Forshaw. Soloists (under instruction): Davies, R. G., Whitehouse, Serck.

Pilots.—Slater, Harrison, Meads, Weale, Hall, R. F., Gort, Nelson, D., Michelson, Ruddy, Lacayo, Twemlow, Gattrill, Mills, Williams.

Passengers (with Mr. Hall:—Davies, R. G., Coatman; (with Mr. Mills): Stern, Emery, Cobbing; (with Mr. Lacayo): Barratt, Hartley; (with Mr. Gattrill), Mandelberg; (with Mr. Meads), Brown; (with Mr. Cantrill): Mercer, Hurst, Garner.

Sunday was quite a good day, and produced 11 hrs. 40 mins. flying, the best of the year so far. The rest of the week was rather flat, no doubt owing to the intense cold. During the week, Mr. R. G. Davies completed all the tests for his R.Ae.C. certificate.

XD has gone into the hangar for overhaul of the engine on completion of its time. QL, however, should be back in service again in a day or two.

## LIVERPOOL & DISTRICT AERO CLUB

FLYING report for week ending Saturday, February 16.—Machines in commission: Avro Avians XX, ZM. Instructors: Flight-Lieuts. J. B. Allen and E. A. Sullock (Hon.). Ground Engineer: Mr. H. Pixton. New Pupils: Messrs. W. P. Taylor and G. S. Bailey. Total hours flown: 23 hrs. 20 mins.

Fourteen pupils totalled 14 hrs. 40 mins.; two soloists totalled 45 mins.; Thirteen "A" pilots totalled 6 hrs. 25 mins.; three passenger flights totalled 45 mins.; nine test flights totalled 45 mins.

On Tuesday last Flight-Lieut. Allen was giving dual instruction to Mr. Waller when he observed several people running about the aerodrome in a distracted manner. After giving control to his pupil Allen did a little wing walking, and thus observed one Radius Rod hanging free from its axle. Returning to his cockpit and explaining that a crash was about to take place, Allen made a magnificent landing on the remaining serviceable wheel—without causing any damage, except, of course, a broken "prop."

Saturday was a black day for the Flying Sub-Committee. The Forced Landing Competition for the John Leeming Challenge Trophy was held, with the following results:—

**Winner**.—Mr. A. Mouldsdales, who put up a really excellent performance.

**Second**.—Mr. T. Naylor, who led his wife by two marks. Both showed excellent judgment, Mr. Naylor gleaming his extra two marks on his superior pull up after crossing the tape.

Fourth place, Mr. Greenhalgh; fifth, Mr. Benson; sixth place was a tie between Mr. Ward (Flying Committee) and Mr. Francis (4 hrs. solo). Seventh, Mr. Williamson, who has also done very little solo. Messrs. Christie, Crosthwaite, Davison and Leete (all Flying Committee) scored a total of No Marks, which they divided equally between them. Of these four intrepid aviators, Leete put up the best show by striking the tape on both attempts. Christie did ditto and added bad landings, whilst Davison did worse, undershooting by about a quarter of a mile on his first attempt. At his second (owing it is thought to an error of judgment) he actually arrived on the aerodrome and landed perfectly about 30 yards from the tape—unfortunately on the down wind side.

The remaining member of the luckless Flying Committee, Mr. Crosthwaite, gave a hair-raising example of how not to make an approach and caused Flight-Lieut. Allen to do some very quick thinking.

As somebody remarked "A very pleasant and instructive afternoon."

Our thanks are due to Mr. John Leeming who acted as one of the judges and presented the very handsome trophy, which created all the trouble; to Sir Sefton Brancker, who came over specially to act as judge, counsellor and friend and enlivened the proceedings by wearing a weird and wonderful coat that would have made Joseph look like an undertaker, and to Sadr.-Ldr. Whistler, of Sealand, who shared the duties of judge in a most efficient and fair manner.

## MIDLAND AERO CLUB

REPORT for week ending February 16.—The total flying time was 22 hrs. 6 mins. Dual, 10 hrs. 50 mins.; solo, 6 hrs.; passenger, 4 hrs. 5 mins.; test, 1 hr. 11 mins.

The following members were given dual by Flight-Lieut. T. Rose, D.F.C., and Mr. W. H. Sutcliffe: L. V. Mann, J. H. Stevens, J. N. Fisher.

Advanced dual: H. C. Wilks, W. M. Morris, M. A. Murtagh, E. D. Wynn, H. J. Willis, C. W. R. Gleeson, W. L. Handley.

"A" Pilots: E. P. Lane, R. L. Jackson, S. H. Smith, C. C. Jones, W. Swann, H. J. Willis, E. D. Wynn, M. A. Murtagh, H. J. Lattey, J. Cobbe, R. C. Baxter, C. W. R. Gleeson.

Soloists: W. L. Handley, M. Blakeway.

Passengers: E. Hanson, R. D. Marks, L. W. Farree, W. Swann, S. H. Smith, H. J. Barnett, E. Russell, J. E. Hicks, L. V. Mann, Miss M. Pruce. Messrs. Twemlow and Hall, in a "Moth," paid us a visit on Saturday.

## NEWCASTLE-UPON-TYNE AERO CLUB

REPORT for week ending February 17.—Instructor: G. M. S. Kemp. Ground engineer: K. C. Brown. Asst.: J. Tait. Aircraft: 3, Pt, QV, LX. Total flying time for week: 4 hrs. 25 mins. Instruction: 4 at 2 hrs.; "A" Pilots: 5 at 2 hrs. 15 mins.; test: 1 hr. 10 mins.

Arctic conditions have prevailed here during the week and flying has been almost impossible with the result that little of interest has arisen.

Mr. J. D. Irving intends flying his "Moth," ADA, to London this week to complete his tests for a "B" licence.

## NORFOLK & NORWICH AERO CLUB

REPORT for week ending February 17.—Instructor: J. C. Houston, M.C. Ground engineer: A. Kirkby. Machines: 3, QX, XE, ZW. Flying time for week: 3 hrs. 20 mins. Dual: 1 hr. "A" licence: 2 hrs. 10 mins. tests: 10 mins.

We have been so snowed up this week here that only the boldest have ventured the upper climes. It has been intensely cold on the ground and everywhere is frozen up.

ZW has been "top overhauled" and is once more in fine fettle ready for the nice weather which we are waiting for.

## SCOTTISH FLYING CLUB, LTD.

REPORT for week ending February 16.—Chief instructor: R. M. Stirling, A.F.C. Ground engineer: W. A. R. Calder. Machines in commission: "X Moths," G-EBVT and G-EBUX. Dual instruction: 1 hr. 40 mins. Solo flying: 5 hrs. 30 mins. Passenger flights: 5 hrs. 30 mins. Tests: 30 mins. Total for week: 13 hrs. 10 mins.

Instruction (with Mr. Stirling): Messrs. A. McIlwaine, A. Cairns Smith, T. F. Steele, and D. Gardner.

In place of the usual diatribe against adverse weather, our report this week is concerned with misfortune of much greater import. On Sunday afternoon, Mr. F. W. Murray, accompanied by Mr. A. Russell as passenger, crashed very badly in a field on the outskirts of Lenzie, both being injured, Mr. Russell rather severely. The sympathy of the Club goes to both and we wish them a very speedy and complete recovery. The machine involved, G-EBVT, appears to be completely written off. On top of this disaster, G-EBYG is out of



# A GREAT UNDERTAKING

As makers of the widest and most successful range of British aircraft and engines the Armstrong Siddeley Development Co. Ltd. is in a unique position to offer the results of its extensive experience on matters relating to air transport, training, fighting or private flying machines on land or sea in any part of the world.

Brief details of aircraft and machines are given below. Full particulars and prices may be obtained on application.

## AIRCRAFT

### AIRCRAFT FOR THE SERVICES

The Armstrong Whitworth All-Steel Atlas 2-seater Fighter or reconnaissance machine, fitted with an Armstrong Siddeley Jaguar engine and either wheels or floats.

The Armstrong Whitworth All-Steel Siskin 3.A. single seater Fighter fitted with an Armstrong Siddeley Jaguar engine.

The All-Steel A.W.A. 14 high performance Fighter fitted with an Armstrong Siddeley Jaguar engine.

### AIRCRAFT FOR CIVIL PURPOSES

The Armstrong Whitworth Argosy. A 20-seater Airliner fitted with three Armstrong Siddeley Jaguar engines.

The Avro Commercial Monoplanes. A 4-5 seater or 8-10 seater both fitted with three Armstrong Siddeley engines.

The Avro-Avian. A 2-seater light aeroplane fitted with Cirrus or Armstrong Siddeley Genet engine and either wheels or floats.

### AIRCRAFT FOR SCHOOL & CLUB PURPOSES

The Avro Gosport, fitted with Armstrong Siddeley Mongoose engine and either wheels or floats.

The Avro 504.N. fitted with Armstrong Siddeley Lynx engine and either wheels or floats.

The Avro-Avian, fitted with Cirrus or Armstrong Siddeley Genet engine and either wheels or floats.

## ENGINES

### THE LEOPARD

The Armstrong Siddeley 700-750 h.p. 14-cylinder Leopard for civilian use or for carrying troops or torpedoes.

### THE JAGUAR

The Armstrong Siddeley 460-500 h.p. 14-cylinder Geared Jaguar for Civil or Service requirements. Jaguar engines have been in service on the London-Paris Airway for over three years.

The Supercharged 14-cylinder Jaguar is specially designed for maintaining power at high altitude.

*Note.*—The Armstrong Siddeley Geared Centrifugal Supercharger was the first device of its kind supplied to the British Government and has now been in use for three years.

### THE LYNX

The Armstrong Siddeley 230 h.p. 7-cylinder Lynx as used on the Amsterdam-Batavia, Munich-Milan and other airways.

### THE MONGOOSE

The Armstrong Siddeley 130-140 h.p. 5-cylinder Mongoose engine for training work on land or sea.

### THE GENET

The Armstrong Siddeley 80-88 h.p. 5-cylinder Genet, an engine which is very much lighter than any engine in its class and is, therefore, particularly suitable for powering light aircraft.

SIR W. G. ARMSTRONG WHITWORTH AIRCRAFT LIMITED.  
Works & Aerodrome: Whitley, Coventry. London: 10 Old Bond Street, W.1

ARMSTRONG SIDDELEY MOTORS LIMITED.  
Head Office & Works: Coventry. London: 10 Old Bond Street, W.1

A. V. ROE & COMPANY LIMITED,  
Newton Heath, Manchester  
and 166 Piccadilly,  
London, W.1.

# THE AVRO TEN

## *A Three Engined Commercial Monoplane*

The Avro Ten is a British version of the Fokker F.VII-3m., built under licence from the Fokker Company (N. V. Nederlandsche Vliegtuigenfabriek).

It carries eight passengers and is fitted with three 230 h.p. air-cooled Armstrong Siddeley Lynx engines.

Monoplanes of this type have attained a world-wide reputation for reliability, ease of maintenance and economy of running—qualities that have been proved during a period of several years.

They are used by the principal Dutch, Swiss and Italian Airlines.

## *Leading Features*

**ENDURANCE.** 4 or 6 hours according to fuel capacity at a cruising speed of 96 m.p.h. with normal full load.

**CONTROL.** Complete dual control with side-by-side seating for pilots. Tail trimming gear allows large variation in the position of the centre of gravity.

**CABIN.** Dimensions 10' x 5' x 6' with seats for eight passengers. Broad windows with wide angle views. Large door and direct access by fixed step.

**BAGGAGE.** Three compartments, total capacity 114 cubic feet.

**FUSELAGE.** Tubular steel with welded joints braced with steel struts and high tensile steel wire. Covered with fabric.

**UNDERCARRIAGE.** Special design of simple construction providing wide track. Rubber shock absorbers with special method of adjustment.

**ENGINE MOUNTING.** Of simple design permitting quick removal.

**TANKS.** Oil tanks fitted behind engines, fuel tanks fitted in wing providing simple gravity feed. Capacity with two tanks 150 gallons. With three tanks 225 gallons.

**WING.** Single unit of cantilever construction. Built of wood and covered with plywood to facilitate maintenance.

**A. V. ROE & COMPANY, LIMITED**  
MANCHESTER

# THE LYNX ENGINE

*A 7 Cylinder Air-Cooled Radial*

The 230 h.p. Armstrong Siddeley Lynx engine has attained a world-wide reputation for reliability and ease of maintenance.

It was with Lynx engines that Lieut. Koppen flew his Fokker F.VII-3m. from Amsterdam to Batavia and back, covering 18,000 miles in 18 days. It was with Lynx engines that Fokker machines repeated the Amsterdam-Batavia flight with equal reliability last summer, and it was with Lynx engines that the difficult Munich-Milan Italian Airline and two new Airlines in Switzerland were equipped.

Lynx engines are used in more than twenty different countries, where their independence of climatic conditions have been amply proved. They have been used with equal success in Central Africa and within the Arctic Circle.

Fitted on Avro Aircraft they are the standard training engine of the British Air Force and are widely used for seaplane training. They are also used for two-seater reconnaissance machines, single-seater fighter aircraft, deck-landing aircraft and twin-engined seaplanes.

Many of their principal parts are interchangeable with those of the Armstrong Siddeley 14-cylinder Jaguar and 5-cylinder Mongoose engines. Where different types are in service this effects great economy in the storage of spares and general maintenance.

## *Leading Features*

7 cylinders, 5" bore x 5.5" stroke.

Compression ratio 5 to 1.

Normal r.p.m. 1,900. Maximum r.p.m. 2,090.

Engine weight 513 lbs.

Direction of rotation, Left Hand Tractor.

**ARMSTRONG SIDDELEY MOTORS LTD.**  
COVENTRY



A  
REMARKABLE  
PERFORMANCE

The Armstrong Siddeley Jaguar engines used by Imperial Airways Limited on the Argosies flying between London and Paris have set up a period of 400 hours between overhauls, the usual top overhauls having been discontinued altogether.

This achievement is claimed as a record of endurance, unsurpassed by any other engine in the world.

ARMSTRONG SIDDELEY  
MOTORS LIMITED  
COVENTRY

commission for sundry repairs, with the result that G-EBUX has been left to carry on alone during the latter part of the week.  
Instructional work is still badly handicapped by adverse weather, and there is little of general interest to report.

**SUFFOLK & EASTERN COUNTIES AEROPLANE CLUB**

REPORT for week ending February 16.—Aerodromes: Hadleigh, Suffolk, and Conington, Cambs. Seaplane base: Brightlingsea, Essex. Instructor: G. E. Lowdell, A.F.M. Ground engineers: W. L. Garner and E. Mayhew. Aircraft: 3 Blackburn "Bluebirds," RE, SZ, and UH. Flying time for week: 5 hrs. 5 mins. by Suffolk and Cambridge Aero Clubs, as follows:—  
**Suffolk Aero Club.**—Flying time: 2 hrs. 10 mins. Five members had dual instruction (55 mins.). One member flew solo under instruction (20 mins.). Flights were made by one "A" licence member (35 mins.). Four tests (20 mins.).

Few of our members appear to wish to train for a Polar flight; hence, presumably, the low hours. We are glad to find that light aeroplanes do not use water-cooled engines; many members' cars have frozen up on the way to the aerodrome. Mr. Mayhew, our ground engineer, visited the Air Ministry and returned with "A" added to his "C" Licence. In future, he will perform all the ground engineer's duties, as we found our experiment of having a separate man for "A" and "C" duties was neither economical nor very satisfactory. Our thanks are due to Mr. W. L. Garner, who, weather permitting, should obtain his pilot's "A" Licence before returning to the sterner duties of ground engineering on Imperial Airways' Middle East Service, for kindly assisting us as voluntary ground engineer during the transition period. This is the second time he has kindly come to our assistance; truly his spell of home leave has been a 'busman's holiday.

**Cambridge Aero Club.**—Report for week ending February 16.—Flying time: 2 hrs. 55 mins. Six members had dual instruction (2 hrs. 50 mins.). One test (5 mins.).

One new member started dual instruction during the week. There is great joy among the Cambridge members because their flying time this week is better than Suffolk. They are seen to walk about the aerodrome muttering something to the effect that coming events cast their shadows.

**YORKSHIRE AEROPLANE CLUB**

REPORT for week ending February 16.—Pilot instructor, H. V. Worrall. Ground engineer, R. Morris. Machines in commission, 3 (TB, SV and RF). Flying time, 7 hrs. 45 mins. Instruction (5), 1 hr. 55 mins. Soloists (2), 2 hrs. 5 mins. "A" pilots (7), 3 hrs. Passengers (3), 20 mins. Test flights (4), 25 mins.

On Thursday, February 14, Mr. A. Senior accomplished his height test. Very little flying this week owing to severe weather conditions.

**FROM THE FLYING SCHOOLS**

**Brooklands School of Flying, Brooklands Aerodrome**

REPORT for week ending February 17.—Managing director, Captain H. D. Davis, A.F.C. Instructors, Capt. H. D. Davis, A.F.C., Capt. E. A. Jones and Major C. M. Pickthorn, M.C. Machines in commission, Renault Avros G-EBVE and G-EBWJ. Moth G-EBMV. Total flying time, 8 hrs.

Owing to the intense cold during the week, few pupils have ventured into the air and have spent most of their spare time skating on the frozen pond at the back of the firm's bungalows.

Mr. C. A. Squarey and Mr. L. R. Lee have joined the School and taken up quarters in our bungalows on the aerodrome.

**Henderson Flying School, Croydon Aerodrome**

REPORT for week ending February 10.—Dr. Wall, late of "Anzani-Avro" fame, is now a "Moth" owner, and has been putting in useful practice in

"slightly faster" landings. He and his instructor weigh 31 stone together, which makes the unfuelled weight up to within 87 lbs. of full load! Presumably, the Air Ministry consider it safer to fly with only 8 gallons of petrol and 2 of oil than to allow a sensible margin of "overload." Luckily, Dr. Wall, when flying for pleasure will be able to exceed this weight and so get about the country as a normal person. Two new pupils joined up this week. Miss Fernie and Mr. Combe, though why anyone should brave this awful weather when summer is supposed to be on the way, one cannot imagine.

The exceptional local interest in all the air liners and private aircraft adds greatly to the pupil's pleasure while waiting to fly, while an adjournment to the comfortable hotel is something to look forward to after a frozen half-hour in the air.

REPORT for week ending February 16.—No flying this week as the aerodrome takes too severe toll of tail skids and tyres to make it worth while when the ruts are frozen hard. Good progress with the two experimental monoplanes to be reported.

Mr. Guinness took the Moth to Paris—and left it there with a broken magneto coupling—the impulse starter being jammed!

**North Sea Aerial and General Transport, Brough**

REPORT for week ending February 9.—In spite of the intense cold which has prevailed here during the week, flying was carried out on four days, under difficulties, mostly due to fog.

The weather has been completely unsuitable for *ab initio* pupils, so that no instruction was given on "Bluebirds," and the only flying done on them was by Mr. Loton, who gave a demonstration on Thursday.

Messrs. A. G. Loton and J. B. Stockbridge gave 1 hr. 50 mins. dual on "Kangaroos," and Flying Officers Lane, Barker, Atkinson and Lumsden carried out 11 hrs. 50 mins. solo, which, with a 5 mins. test flight by Mr. Stockbridge, brings the total amount of flying for the week to 14 hrs. 45 mins.

Flying Officers Lane and Barker left on Wednesday, having completed their training for the quarter, and Flying Officers Atkinson and Lumsden reported on Thursday and Friday respectively. Flying Officer Maconochie reported on Saturday, on which day there was no flying owing to thick fog and heavy rain.

REPORT for week ending February 16.—The distinguishing feature of this week's weather has been the heavy snowstorms which lasted for four days, rendering any kind of flying completely impossible. Flying instruction was carried out on the remaining three days of the week and Messrs. A. G. Loton and J. B. Stockbridge gave 1 hr. 20 mins. dual on "Kangaroos," whilst Flying Officers Atkinson, Lumsden and Maconochie carried out 9 hrs. 45 mins. solo.

Messrs. H. W. Hall, J. Riddell and A. Riddell were given 2 hrs. 10 mins. dual on "Bluebirds," but in the prevailing conditions it was not possible for any of them to fly solo.

The only incident of note during the week was the chartering of a "Bluebird" on Saturday for a hurried journey to London, piloted by Capt. Woodhead. Apart from this trip, 13 hrs. 15 mins. flying was carried out on the school, despite the weather conditions.

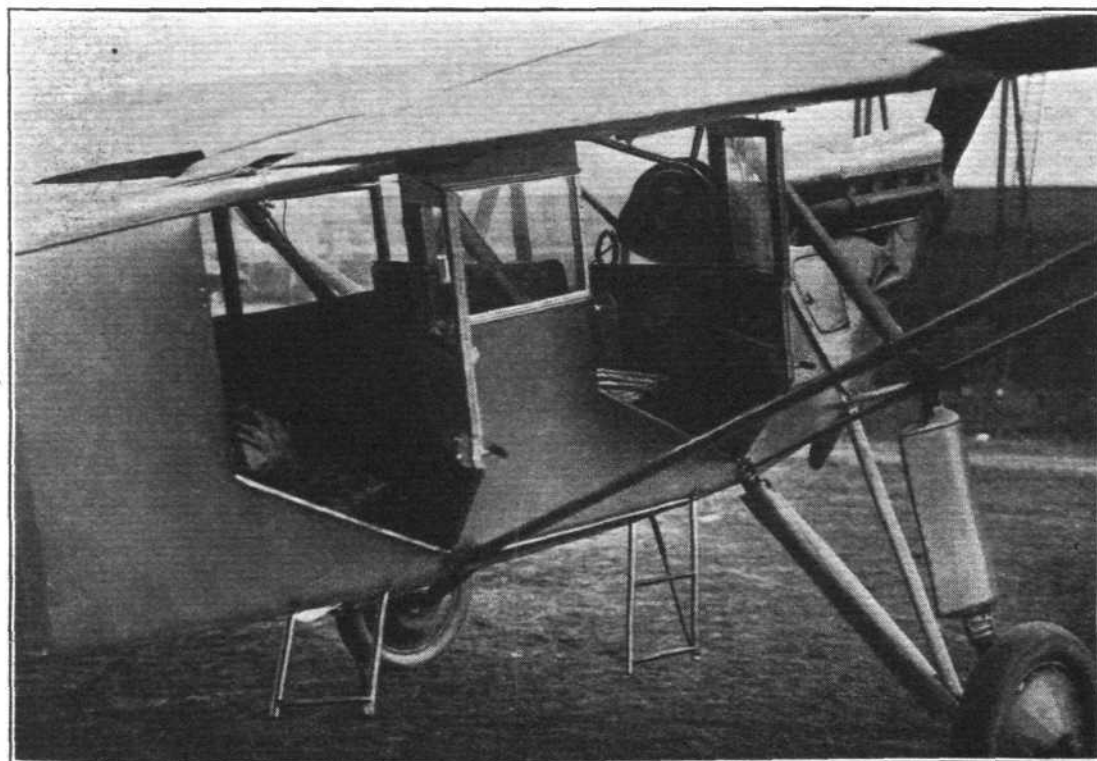
**Surrey Flying Services School of Flying, Croydon Aerodrome**

REPORT for week ended February 17. Instructor, Mr. Flynn. Ground engineers, R. Fox, F. A. LaCroix. Secretary, R. D. Price, Croydon Aerodrome. Aircraft, Avro 548 G-EBIV. Flying time for week, 4 hrs. 50 mins.

The following had instruction with Mr. Flynn, Messrs. Rogers, Fox, Brown and Lane. Solo, Mr. Brown.

On Wednesday, the 13th, under rather unfavourable conditions, Mr. Brown succeeded in doing his first solo, and put up quite a good show, after only 7 hours' dual. Bad weather again prevented us from carrying out our usual programme. On Wednesday Mr. Flynn and Mr. McLennan went to Salisbury where they obtained some fine photographs of the fine old Cathedral surrounded by snow. These photos were for the Press.

Passengers carried for the week, 15. Our other machines in the workshop are progressing, and are looking more complete day by day.



The Cabin accommodation of the new de Havilland "Hawk Moth." As the machine is a monoplane access to the cabin is very easy.

["FLIGHT" Photograph]

# AIR-COOLED ENGINES IN SERVICE

THE paper read by Mr. Roy Fedden before the Royal Aeronautical Society and Institution of Automobile Engineers, on February 14, was one of extraordinary interest. Unfortunately, it is quite impossible for us to publish it in full, but it is hoped that the summary given in this and next week's issue will be of some assistance in placing on record the chief points of the paper.—Ed.

It is now rather more than three years since I had the honour of presenting a paper before the Royal Aeronautical Society dealing with air-cooled aero engines. At that period, the air-cooled aero engine had but recently emerged from a state of doubt and misgiving, due to certain early unsatisfactory types. In a little more than four years, there has been a remarkable change over to air-cooled aero engines for aircraft. To-day, a large proportion of British Military aircraft employ air-cooled radial engines on various types of machines, and both in England and on the Continent the use of air-cooled radial engines for air transport aircraft of all types is almost universal. In America, the development of the air-cooled radial engine as been synonymous with the general rapid growth of aviation. Without exception, the American long-distance ocean flights of the past two years have all been made with air-cooled radial engines.

The light aeroplane movement, which really began with the Lympne trials of 1924, and which has spread throughout the world during the last four years, was only made possible by the use of the air-cooled motor. This great increase in the popularity of air-cooled engines has induced a number of new firms to enter the field. At the Paris Salon last year, seven new air-cooled engines were shown, and at the recent Chicago Aero Show more than 20 newcomers exhibited air-cooled aero motors.

There are several interesting air-cooled engine designs under experimental development to-day.

In attempting to give you some information on air-cooled engines in service, there are a large number of motors to choose from, but only those engines which have been in extensive use over a reasonable period of time have been considered.

(The lecturer then showed lantern slides of a number of radial engines, such as the "Jupiter," "Jaguar," "Lynx," "Whirlwind" and "Wasp," and of the 4-cyl. in-line "Cirrus.")

## Service rendered by Air-Cooled Engines

From my introductory paragraph you have gathered that during the last four years a very considerable change has come over the type of power unit employed on aircraft both for military and commercial purposes.

The largest proportion of aircraft are at present engined with air-cooled motors, and the fact that this type of engine is used so extensively for military and commercial work, and will be used even to a larger extent during the next few years, is sufficient justification for investigating what service these engines are giving at the present time, and what steps can be taken to increase their life and efficiency.

Being interested in one of the types of air-cooled engines under review, I have been particularly anxious to be quite dispassionate, and to record as much evidence of other types as possible, and I have been to some considerable pains to endeavour to collect as much accurate data as possible.

A very considerable number of hours has been flown with air-cooled radial engines in the Royal Air Force, but the information to be obtained therefrom is, unfortunately, unavailable.

One has heard rumours of tabulations on the relative reliability of service engines; if these rumours are correct it is pleasing to note that the "Jupiter" and "Jaguar" are at the right end of the table.

The following figures have been obtained through the kindness of various firms:—

Table No. 1

## SERVICE DATA ON BRISTOL JUPITER VI ENGINES

### DATA FROM IMPERIAL AIRWAYS ON MIDDLE EAST ROUTE

Number of machines operated	5
Type of machines operated	3 engined De H. Hercules
Number of engines	20
Period covered by data	2 years
Total hours' operation	9,280
Average hours' operation per engine	468
Maximum recorded hours, one engine	960

Average hours between overhaul	400
Average man hours for overhaul—Whites	1,356
" " " "—Natives	
Average operating, r.p.m.	1,500
Average fuel consumption, galls./hour	19.7
Average oil consumption, galls./hour	0.57

Table No. 2

## SERVICE DATA ON ARMSTRONG SIDDELEY JAGUAR IV

### DATA FROM ARMSTRONG SIDDELEY, LTD., FROM IMPERIAL AIRWAYS SERVICE

Number of machines operated	3 engined A.S. Argosy
Type of machines operated	
Number of engines	
Period covered by data	
Total hours' operation	
Average hours' operation per engine	
Maximum recorded hours, one engine	
Average hours between overhauls	400
Average man-hours for overhaul	480
Average cruising, r.p.m.	1,625
Average fuel consumption	
Average oil consumption	

Unfortunately the information concerning this table has miscarried, and I have not been able to include it in full.

Table No. 3

## SERVICE DATA ON GNOME ET RHONE JUPITER ENGINES FROM K.L.M. ROYAL DUTCH AIR LINE

Number of machines operated	15
Number of engines operated	30
Period covered	3 years
Total hours' operation	25,000
Average hours' operation per engine	830
Maximum recorded hours on one engine	1,860
Maximum running one engine in one year	735 hours
Average hours between overhaul	250
Overhaul staff, skilled	10
Overhaul staff, unskilled	27
Cost per running hour, including maintenance, overhaul and spares	17.5 shillings
Average operating r.p.m.	1,550
Average fuel consumption, gallons, per hour	20
Average oil consumption, gallons, per hour	0.8
Man hours for complete overhaul	332

Table No. 3A

## SERVICE DATA ON GNOME ET RHONE JUPITER IV ENGINES COLLECTED FROM K.L.M. ROYAL DUTCH AIR LINES ON 11 ENGINES OF 16,120 TOTAL RUNNING HOURS

Component.	Average life to date.
	Hours.
Crankcase	1,500
Crankshaft	1,000
Valve—inlet	1,000
Valve—exhaust	650
Valve spring	1,500
Valve guides—inlet	615
Valve guides—exhaust	650
Piston	200
Piston ring	165
Scraper ring	270
Cylinder	1,500
Main roller bearings	800
Master rod	750
Articulated rods	1,500
Gudgeon pins	360

Table No. 4.

## SERVICE DATA ON WRIGHT WHIRLWIND ENGINES FROM NINE DIFFERENT OPERATORS

Number of engines considered	91
Total hours' operation	36,464
Average hours' operation per engine	401
Maximum recorded hours on one engine	2,000
Average hours between overhauls	290
Cost of parts per operating hour	4.3 shillings
Average operating r.p.m.	1,625
Average fuel consumption, gallons per hour	11.3
Average oil consumption, gallons per hour	0.42



# THAT'S ALL



This fin or tail plane extension will fit at A, or B, or C.

All flying & landing wires are identical.

The left & right sides of the chassis are interchangeable.

What  
"Spartan"  
Interchangeability  
Means.

Nos: 4 5, & 6. of the series.

4. The fin & tail plane extensions

5. The chassis.

6. Flying & landing wires.

SIMMONDS AIRCRAFT LTD:

SOUTHAMPTON.

Save time by using the Air Mail.

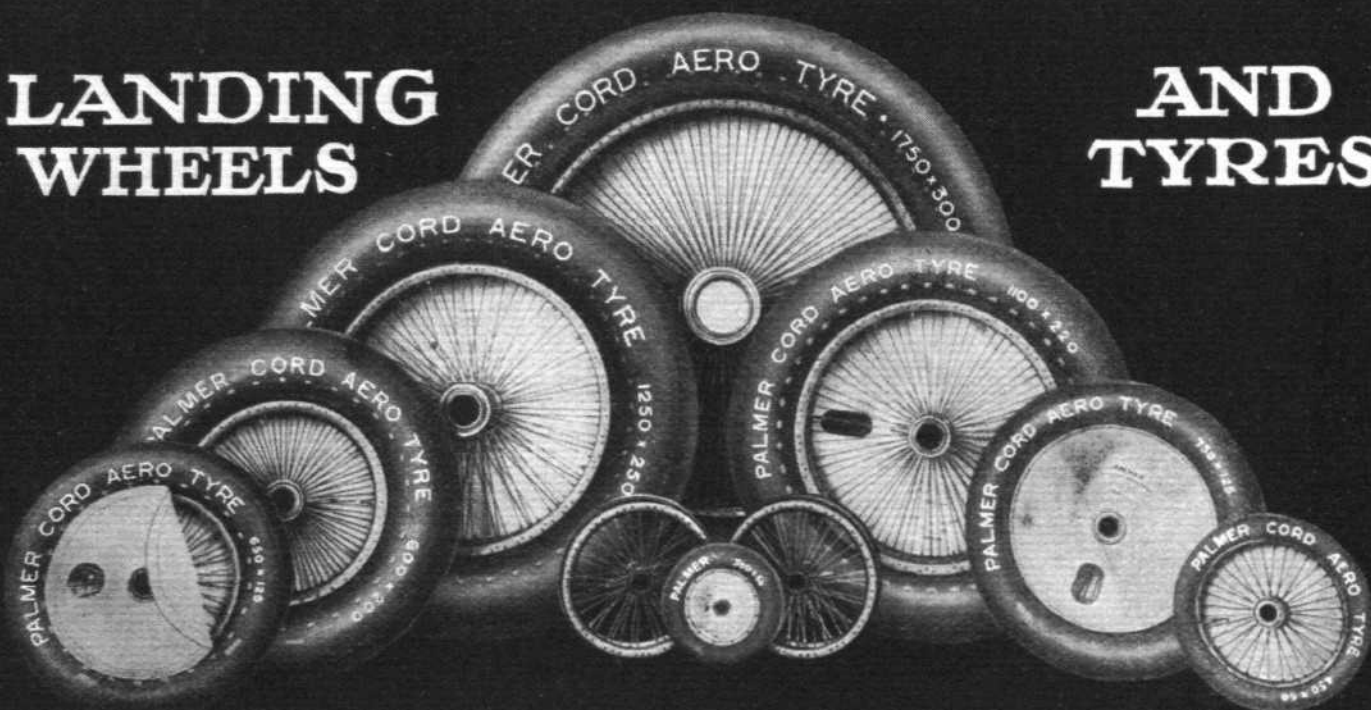


# PALMER



**LANDING  
WHEELS**

**AND  
TYRES**



## STANDARD SIZES.

Tyre Size	Wheel No.	Hub		Track Line	Tyre Size	Wheel No.	Hub		Track Line	Tyre Size	Wheel No.	Hub		Track Line
		Length	Bore				Length	Bore				Length	Bore	
375x55	168	m/m	m/m	m/m	700x100	176	m/m	m/m	m/m	1000x180	148	m/m	m/m	m/m
"	195	111'12"	25'4"	Central	"	179	178'	44'45"	Central	"	149	220'	80'	Central
300x60	16	111'12"	25'4"	Central	650x125	119	178'	55'	132/46	"	155	185'	66'67"	Central
450x60	30	89'	31'75"	Central	"	147	178'	55'	Central	900x200	107	185'	55'	Central
"	172	130'	38'09"	Central	"	188	120'	34'92"	Central	"	108	185'	55'	Central
575x60	21	160'	28'	Central	"	336	178'	44'45"	132/40	"	128	220'	66'67"	Central
"	180	150'	38'09"	104/46	750x125	77	178'	44'45"	132/46	"	137	250'	80'	Central
"	186	120'	34'92"	Central	"	92	185'	55'	135/50	"	157	185'	80'	Central
"	190	150'	38'09"	Central	"	95	185'	55'	Central	"	202	185'	60'32"	Central
600x75	21	160'	28'	Central	"	99	178'	38'89"	132/46	1100x220	134	220'	66'67"	Central
"	180	150'	38'09"	104/46	"	112	150'	38'09"	Central	"	136	250'	80'	Central
"	186	120'	34'92"	Central	"	176	178'	44'45"	Central	975x225	192	185'	60'32"	Central
"	190	150'	38'09"	Central	"	179	178'	55'	132/46	"	194	185'	55'	Central
700x75	78	178'	44'45"	132/46	800x150	161*	185'	55'	135/50	1250x250	314	250'	80'	Central
"	79	178'	44'45"	Central	"	162*	185'	55'	Central	"	154	304'8"	101'6"	Central
"	100	178'	38'09"	132/46	"	163*	185'	66'67"	135/50	"				
"	101	178'	31'75"	132/46	"	169†	185'	55'	135/50	1500x300	305	304'8"	152'4"	Central
"	196	178'	55'	Central	"	177	185'	55'	135/50	"	306	304'8"	101'6"	Central
600x100	188	120'	34'92"	Central	"	183	185'	55'	Central	1525x325	197	304'8"	101'6"	Central
"	304	150'	38'09"	104/46	"	211*	185'	60'32"	135/50	1750x300	139	400'	152'4"	Central
"	333	120'	34'92"	Central	1000x150	167	185'	55'	125/60	"	191	350'	150'3"	Central
700x100	77	178'	44'45"	132/46	"	174	250'	80'	Central	1750x350	193	400'	125'	Central
"	92	185'	55'	135/50	"	182	185'	55'	Central					
"	95	185'	55'	Central	"	187	220'	66'67"	Central					
"	99	178'	38'89"	132/46	"	201	185'	60'32"	125/60					
"	112	150'	38'09"	Central	"	210	185'	60'32"	Central					

\*Wheels Nos. 161, 162, 163, and 211 are of stronger type than the other wheels for 800 x 150 tyres. †Wheel No. 169 is fitted with Ball Bearings (L/NB)  
Grease gun equipment is now a standard fitting on all wheels.

## THE PALMER TYRE LIMITED,

Contractors to the Admiralty, the War Office, and the Air Ministry,

Telegram:—  
"Tyricord, Cannon, London."

100-106, CANNON STREET, LONDON, E.C.4.

Telephone:—  
City 1477 (Two Lines).  
(579)

Kindly mention "Flight" when corresponding with advertisers.

**Table No. 5**  
SERVICE DATA ON WRIGHT "WHIRLWIND"  
ENGINES FROM STOUT AIR SERVICES INCORPORATED

Motor Number.	First Overhaul.		Second Overhaul.		Third Overhaul.		Total.	
	Hrs.	Mins.	Hrs.	Mins.	Hrs.	Mins.	Hrs.	Mins.
8108	271	30	130	52	—	—	620	17
7317	259	25	336	24	—	—	696	6
8322	150	57	—	—	—	—	310	35
8168	124	50	—	—	—	—	124	50
8169	124	50	—	—	—	—	124	50
7653	188	13	295	40	175	25	714	57
7324	259	25	271	12	—	—	708	12
7655	308	49	338	43	—	—	768	23
7319	259	25	330	44	—	—	652	44
8945	—	—	—	—	—	—	36	45
8946	—	—	—	—	—	—	36	45
8944	—	—	—	—	—	—	36	45
7800	272	35	—	—	—	—	272	35
7654	167	51	349	42	275	54	793	27
8321	256	26	—	—	—	—	256	26
8521	49	47	—	—	—	—	49	47
							6203	24
Average ..	207	—	293	—	225	—	388	—

**Table No. 8**  
SERVICE DATA ON "CIRRUS" ENGINES  
FROM THE A.D.C. CO. FROM 3 AERO CLUBS

Number of machines operated .. .. .	4
Type .. .. .	School Moths and Avians
Number of engines operated .. .. .	4
Period covered .. .. .	2½ years
Total hours' running .. .. .	3,083
Average hours per engine .. .. .	771
Maximum recorded hours, one engine .. .. .	826
Average hours between overhauls .. .. .	280
Maximum hours recorded between overhauls .. .. .	354
Average man hours for overhaul .. .. .	110
Average hours' life of parts requiring replacement, piston rings, rocker bushes, rear roller races .. .. .	300
Cylinder barrels .. .. .	600
Average operating, r.p.m. .. .. .	1,780
Average fuel consumption, galls. per hour .. .. .	4.5
Average oil consumption, pints per hour .. .. .	1

I am afraid the above rather scattered information is all the actual data that I have been able to collect on the running times of air-cooled engines and their components.

To illustrate the difficulty in compiling comparable data, it is interesting to note the difference in man hours shown in the different tables on the same type of engine. A broad review of the charts would show about equal results from British and American engines.

**Table No. 6**  
SERVICE DATA ON "JUPITER VI" ENGINES COLLECTED FROM 20 OVERHAULS ON STANDARD DIRECT-DRIVE ENGINES. AVERAGE TIME BETWEEN OVERHAULS 336 HOURS

Component.	Number off per Engine.	Number of Replacements.	Average Life Hours.	Maximum Observed, Hours to Date.	Average Cause of Replacements.
Crankcase .. .. .	1	Nil	1,162	1,413	
Crankshaft .. .. .	1	Nil	1,162	1,413	
Valve, inlet .. .. .	18	11	1,091	1,413	Worn on stem or defective seat.
Valve, exhaust .. .. .	18	59	683	1,015	Worn on stem or pitted seat.
Valve spring .. .. .	72	132	839	1,413	Lost pressures.
Valve guide inlet .. .. .	18	8	1,060	1,413	Scored and worn.
Valve guide exhaust .. .. .	18	36	872	1,279	Scored and worn.
Piston .. .. .	9	6	813	1,413	Gudgeon pin bosses-oversize.
Piston ring .. .. .	18	164	305	681	Oversize gaps.
Scraper ring .. .. .	9	88	285	904	Oversize gaps.
Cylinder .. .. .	9	2	960	1,413	Scored barrels.
Cylinder head .. .. .	9	Nil	1,162	1,413	
Big end bearing .. .. .	1	2	872	1,413	White metal collapsed.
Artic. rod bearing .. .. .	8	2	1,116	1,413	Wear.
Master rod .. .. .	1	1	996	1,413	Cracked.
Artic. rod .. .. .	8	Nil	1,162	1,413	
Gudgeon pin .. .. .	9	36	697	1,015	Worn in centre.
Artic. rod pin .. .. .	8	Nil	1,162	1,413	
Prop. hub .. .. .	1	Nil	1,162	1,413	

It is somewhat difficult to obtain exact records of engines over an extended period. Particulars are, therefore, given of three "Jupiter" VI engines which have been installed in the Handley Page "Hampstead" aircraft since 1926 and used on Imperial Airways Continental routes. These are the only engines that have been used in this aircraft during these two years. During the period September, 1926, to September, 1928, the engines ran a total of 4,140 hours, an average of 1,380 hours per engine, and were overhauled twice. With the exception of one cylinder, all the main components, including cylinders, cranks, connecting rods, etc., were used throughout.

**Table No. 7**  
SERVICE DATA ON "CIRRUS" ENGINES FROM THE BRISTOL AND WESSEX AEROPLANE CLUB

Number of machines operated .. .. .	5
Type of machines operated .. .. .	Moth
Number of engines operated .. .. .	5
Period covered .. .. .	2 yrs.
Total hours' operation .. .. .	1,450
Average hours' operation per engine .. .. .	290
Maximum recorded hours on one engine .. .. .	403
Average hours' between top overhaul .. .. .	120
Average hours' between complete overhaul .. .. .	360
Man hours for top overhaul .. .. .	25
Man hours for complete overhaul .. .. .	100
Cost per running hour, including maintenance, overhaul and spares .. .. .	1.1s.
Average operating r.p.m. .. .. .	1,800
Average fuel consumption, galls. per hour .. .. .	4
Average oil consumption, pints per hour .. .. .	0.5

In a previous paper I have endeavoured to outline the advantages of air-cooled radial engines from the point of view of repairs and operation in extreme climates, etc.

I believe I am correct in stating that all these arguments have been fully borne out in practice during the last few years by aircraft using air-cooled radial engines.

#### Constructional Details of Existing Air-Cooled Engines

(a) *Cylinder Construction.*—The forms of cylinder-head construction fall under two main types, either a closed-ended cylinder barrel with head integral with the barrel and an aluminium casting bolted to the head carrying the valves, ports, etc., as in the "Jupiter" engine, or an open-ended cylinder barrel with aluminium head carrying the ports and valve seatings screwed or bolted to the barrel.

The screwed edition of the latter type used on the "Jaguar" engine, and since employed on most of the American air-cooled radial engines, is, from a theoretical point of view, probably the best design, as it should give a more even heat flow throughout the cylinder.

The Bristol Co., up to the present time, have adhered to the closed steel barrel for their large four-valve cylinder of three litres capacity as being a safer proposition and permitting the head to be re-serviced after extended periods of running.

With smaller bore cylinders, where only two valves are necessary, an aluminium casting open to the explosion has proved very satisfactory. For large-bore cylinders, however, I am of the opinion, that a Y-alloy drop forging should be employed, as with four valves the strength of the head is seriously reduced with a casting.

The Curtiss "Chieftain" engine is the only tested air-cooled engine that I know of which uses an overhead camshaft.



I am of the opinion that the enclosed overhead camshaft is worth exploring for the in-line engine, and it should be possible to get a good transference of the valve-gear loading to the cylinder head, and, although there is a general feeling that bending of the camshaft would be experienced, due to the various cylinder expansions, I am doubtful if this would be a problem.

Overhead camshafts have not been very successful for radial engines, and they almost all use push-rod gear. The design of overhead valve gear calls for a good deal of attention. The more efficient the lay-out of the valve gear the worse the drag. It is difficult to get stiffness and long life without the parts becoming heavy and bulky.

The Bristol "Jupiter" engine is, I think, the only type in which any serious attempt has been made to compensate for the increased valve clearances when the cylinder is hot. This is really a serious problem on large cylinders of 5½-in. bore and upwards.

The Pratt & Whitney "Wasp" cylinder is a good example of the American two-valve air-cooled cylinder with completely enclosed rocker gear. A close similarity follows all the American air-cooled cylinder design. Complete enclosure is certainly attractive, but without forced lubrication it may provide a condenser for exhaust products and lead to other troubles. It is certainly not as easy to examine valves and valve springs and rocker clearances.

Provided steps are taken to protect the valve guides from dirt and water, which is quite feasible, I am of the opinion that the valve springs are better not entirely enclosed. I believe there is considerable scope in all existing designs for improvement in the overhead rocker gear.

For large bores the bolted-on, open-ended cylinder head is not feasible.

(b) *Pistons*.—I think we must give the American people due credit for leading the way in Y-alloy castings for pistons, which material is undoubtedly stronger and harder under running temperature conditions of an air-cooled piston of, say, 400° to 420° C. As a rule these pistons give very little trouble, and a thousand hours' life is quite normal.

Gas and scraper rings have eliminated the problems which were met with on some of the earlier air-cooled engines.

Y alloy forgings are certainly the right line of development for pistons, and are a necessity, I believe, for high duty super-charged engines, but a well-designed casting is better than a forged piston in which the heat flow has been curtailed to obtain easier machining.

(c) *Connecting rod assembly*.—The use of master rods and auxiliaries of alloy steel machined all over is universal practice on all high-class radial engines.

Duralumin drop forgings are used extensively for the smaller type of in-line engine.

I believe that the floating big end bush, with built-up shaft, gives the longest life for the big end bearing, although its construction is somewhat of a problem for anything but the single row radial.

Floating bushes for articulated rod pins and gudgeon pin bushes are, I consider, the best practice.

The case-hardening of a crankpin is an impracticable production proposition, and the introduction of reliable crankshaft stampings, the pins of which might be treated by the nitrogen hardening process, is an obvious line of development.

The problem of crankshaft and connecting rod design for the in-line type engine may be fairly stated to be on "all fours" with the water-cooled engine of corresponding type, except that as the space between the cylinder bores must be at least 33½ per cent. of the bore of the cylinder, it may be expected that for a given size of engine the air-cooled crankshaft will be longer than the water-cooled crankshaft, and, therefore, more liable to give rise to torsional vibration difficulties.

(d) *Crankcases*.—I am strongly in favour of duralumin drop forgings wherever possible for this purpose. Since the introduction of this forging on the "Jupiter," failures have been unknown, and it has proved quite a satisfactory production job.

With the higher temperatures that must be expected in the crankcase on the in-line air-cooled engine the problem of a satisfactory casting may be more difficult than with the corresponding water-cooled engine.

I do not know if it is possible to expect in the near future crankcases cast in a permanent mould or whether it is even

within the bounds of possibility to produce a forged aluminium case for an in-line engine.

(e) *Reduction gearing for air-cooled engines*.—Although aircraft constructors have for some years complained of the propeller speeds of the larger air-cooled engine it is only recently that these engines have been fitted with reduction gear.

(Slides were shown of the "Jupiter" and "Jaguar" reduction gears.)

The reduction gear fits very neatly on the radial engine and certainly has increased its performance, although cooling problems have been increased consequent upon the slower running larger bossed propeller.

I have quoted in a tabulation examples of the actual increase in performance on the same aircraft with a geared "Jupiter" engine.

It is early to speak about the service that is likely to be obtained from these gears, but I consider that the radial engine crankshaft is particularly suited for a reduction gear and is not prone to many of the problems of inertia torque which are sometimes introduced with a reduction gear on an in-line engine, and that the main harmonic can be kept well below the running speed of the engine.

With regard to the gearing of in-line air-cooled engines, of which no experience has been obtained at present, it would appear that the dynamic problems are generally similar to the water-cooled engine.

With an in-line air-cooled engine, if the gearing is not kept on the central axis of the crankshaft, it would appear that the cooling of the cylinder heads would be a very serious problem. On the other hand, with an inverted air-cooled engine, an out-of-line gear would give a satisfactory thrust line for the propeller, and at the same time would help the cooling of cylinder heads.

(f) *Arrangement of Auxiliary Components*.—Generally speaking, the arrangement of components and the reliability of these parts in air-cooled radial engines is at least as satisfactory as with the water-cooled engine.

Flange-mounted magnetos at right angles to the crankshaft axis provide the most accessible arrangement.

I am not in favour of mounting the magneto on the nose of the engine.

For commercial engines a telemeter drive and electric generator drive are desirable.

Accessible oil strainers, oil centrifugers, flexible oil pipe connections and oil thermometer bulb connections should be part of the standard equipment supplied by the engine makers.

With the introduction of high compression and super-charged engines an automatic control, to obviate abuse of the engine at low altitudes, should be standardised and built into the engine.

Summarising, therefore, the constituent parts of air-cooled engines as they exist today, I would submit that the following will make for greater reliability and longer service, viz. :—

(1) The introduction of non-ferrous drop forgings, wherever possible, on all such components as crankcases, cylinder heads, pistons, nose-pieces, etc., and the encouragement of drop forging technique to give us, wherever possible, forgings for all components which at present are castings, except on such parts as carburettors, induction elbows, etc.

(2) The further development of overhead valve gear to reduce drag and prolong life of the components.

(3) The development of valve, valve guide and valve stem materials, which will give longer life under the working conditions of air-cooled engines, where the whole mechanism is not enclosed in a pressure-fed system.

(4) The better protection of cylinder heads against corrosion.

(5) The use of floating bushes, wherever possible, in the connecting rod assembly, and the introduction of a material for crankshafts and connecting rods which can be hardened locally by such a process as nitrogen hardening, without introducing the complication and difficulties of case hardening.

Chromium plating is an alternative to such a scheme and development is proceeding along these lines, but there is a vast gulf between the chromium plating of a household article and a highly stressed part such as a connecting rod bore or crankpin, and one is always suspicious of a coating of any sort which may flake off.

(To be concluded.)

## Skegness Bans Joy-Riding

LAST summer joy-riding in aircraft was very popular on

the beach at Skegness, on the Lincolnshire coast. It has now been banned by the foreshore committee on the council.

# HAWKER AIRCRAFT



[“FLIGHT” Photograph.]

The “HORSLEY” Torpedo Bomber, now in production, represents the most efficient and advanced machine of this type. Particulars can be supplied to Colonial and Foreign Governments on application.

**THE H. G.  
HAWKER  
ENGINEERING CO., LTD.,**

*Designers and Constructors to H.M. Air Ministry and  
Foreign Governments*

**Works :  
KINGSTON.**

**Aerodrome :  
BROOKLANDS.**



**Telephone :  
KINGSTON 6272 (4 lines)**

**Cables :  
“HAWKER, KINGSTON.”**

*Save time by using the Air Mail.*

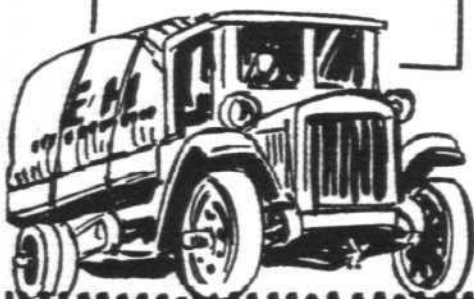
# SAMUEL FOX & CO. LTD.

# STEEL MANUFACTURERS

MANUFACTURERS  
OF  
**COLD ROLLED STRIP**  
AND  
**COLD DRAWN WIRE**

In all sizes and to all specifications for Automobile and Aeroplane Work.

K16, 3S.L., 5W3., S.3,  
Etc.



WE SPECIALIZE  
IN

Cold Working  
**"FIRTH STAYBRITE" STEEL**  
into WIRE all Sizes and  
Specifications.  
**COLD ROLLED STRIP** — All Sizes.  
POLISHED & UNPOLISHED.

On A.I.D. Fully Approved List.  
On Admiralty and War Office Lists.

**SAMUEL FOX & CO., LTD.**

Stocksbridge Works,  
NEAR SHEFFIELD.

Phone: OUGHTIBRIDGE 40871. Grams: "FOX-DEEPCAR."  
(4 lines.)



D.T.D. 43S.  
and  
D.T.D. 43H.



**World's**  
light aeroplane  
**Speed  
Record**

**119.84 m.p.h.**

by  
Gipsy Moth Aeroplane  
on

**Pratts**

**Ethyl Petrol**

TRADE MARK

Distributed by the proprietors of PRATTS SPIRIT—famous for 30 years.

D.A.306

## FOR SAFETY'S SAKE

You cannot afford to use any but the finest quality rubber components. During the War, Luke Turner and Co., and Industrial Rubber Products Ltd., were pioneer manufacturers of aircraft rubber. Their very wide experience is at your disposal to-day.

Petrol Resisting  
Tube.  
Shock Absorber  
Cord.  
Shock Absorber  
Rings.

Rubber Buffers.  
Moulded Rubber.  
Water Hose.  
Pitot Tubing  
Steam Hose,  
Etc., etc.

Quotations gladly submitted  
for every description of  
**AIRCRAFT RUBBER.**

Our release notes authorised by A.I.D.  
CONTRACTORS TO THE AIR MINISTRY.

**INDUSTRIAL RUBBER MANUFACTURERS LTD**  
191-2 Tottenham Court Road,  
London, W.C.

G.J.S.

Kindly mention "Flight" when corresponding with advertisers.



## AIR PROGRESS IN CANADA

WIRELESS telegraphy is to be used as an aid to protect the forests of Ontario from the menace of fire. Aircraft in the service of the Provincial Government engaged in forest patrol are to be equipped with the latest wireless telegraphic apparatus so that the pilots may send reports of the outbreak of fires to their headquarters. The apparatus will have a sending radius of 400 miles.

In its first six months of operation the Great Western Airways, Ltd., carried 1,608 passengers 82,906 miles; explored 2,200 square miles from the air; photographed 600 square miles, and gave flying instructions to 38 students.

Macleod, Alberta, is to have its own aircraft transportation and passenger service, according to an announcement. William Hoodless, town councillor and garage proprietor is purchasing a plane to fly between that point and Calgary and other points of Southern Alberta. That town will be the first in Alberta, other than the big cities, to be served by aircraft.

In Moncton, New Brunswick, the airmail service recently inaugurated between the city and Charlottetown is reported highly satisfactory, having in one week carried three tons of mail matter over the route linking Moncton, Charlottetown and Summerside, which is believed to be a record in air mail transportation in Canada. The plane makes two trips daily.

The remarkable extent to which northern Canada, even into the Arctic circle, is now being opened up by the use of aeroplanes is again evidenced by the inauguration on January 16, by Western Canada Airways, Ltd., of an air service linking Fort Simpson on the Mackenzie River with the railway station at Waterways, the present terminal of the Alberta and Great Waterways Railway. Points included in the schedule of the projected service are Waterways on the Athabaska River; Chipewyan on Lake Athabaska; Fort Smith on the Slave River; Hay River and Resolution on the Great Slave Lake; and Simpson on the Mackenzie River; all of which are important trading posts hitherto only accessible in the winter by dog team, though reached by steamship, motor boat or canoe in the summer months.

The new air service is designed at the outset to carry passengers and the more valuable types of express packages,

including the better varieties of furs. The company's plans call for four trips a week from Waterways, two of which will be to Fort Resolution, providing for a return trip on the same day. Resolution is 512 miles from Waterways, but somewhat less than that by air line.

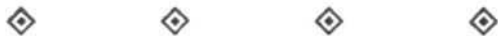
Fort Simpson on the Mackenzie River is a half-way point between the railway terminal at Waterways and the Arctic Circle, being a connecting post particularly for the Liard River traffic. This place will be the objective for two trips weekly, flying north from Waterways one day and returning the next with calls at intermediate points. It is 821 miles from Waterways to Simpson, or somewhat less—750 miles—by air route, the return trip being thus 1,500 miles. The new northern air transport service will be inaugurated by Mr. C. H. Dickens with a super-"Fokker" machine.

The Department of National Defence at Ottawa announces that on January 1, 1929, there were in operation in Canada 333 aeroplanes, or more than three times the total of 101 in use on the same date a year ago. Of that total, it is significant that 246 machines are engaged in commercial pursuits and 87 are being used in Government services.

The increase in the number of aircraft has brought about a corresponding development in flying facilities. There are at present 44 air harbours in Canada as compared with 25 on the same date last year. Licences held by commercial pilots on January 1 numbered 190, or more than four times the figure of 40 on the same date last year.

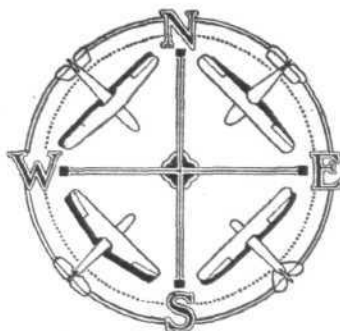
An announcement by the Dominion Post Office Department indicates that Canada's trans-Atlantic mail service has been expedited by the inauguration on January 28 of an air mail service connecting Ottawa with Montreal, St. John and Halifax. Mail taken off eastbound trans-continental trains will leave Ottawa at six o'clock in the morning by air and will arrive in St. John and Halifax in time for afternoon deliveries.

At the outset the schedule will be limited to bi-weekly flights over the entire route, while a daily service will be inaugurated between St. John and Halifax. The schedule for the return westward trip is not yet complete and special attention is being given to the movement of mail-carrying ocean ships. The schedule will be mapped out to speed up mail from the Atlantic seaboard as soon as it arrives.



The Akron Air-Port: This drawing shows the new Akron Goodyear Air-Port, U.S.A., as it will appear when completed, and where two gigantic dirigibles are to be built by the Goodyear-Zeppelin Corporation for the United States Navy. The dirigible hangars are shown in the centre of the field. Aeroplane hangars are at the left of the field. Notice the ship in flight, giving a conception of its size and general appearance. Preliminary work has started on the giant hangar for the first of the two Navy ships.

# AIRISMS FROM THE



# FOUR WINDS

## African Service Flight

THE R.A.F. Fairey-Napier aircraft engaged on the annual flight to the Cape and back from Cairo, reached Khartoum on February 13, and left for Malakal the next day. On February 17 they reached Entebbe and were the first machines to use the new aerodrome. The next day they co-operated with the 4th Battalion, King's African Rifles. On February 19 the machines left for Nairobi.

## Australia-England Flight

SQDR.-LDR. KINGSFORD-SMITH and Flight-Lieut. Ulm the Australians who flew the Pacific on the monoplane *Southern Cross*, are about to start an attempt to fly to England from Australia in the same machine.

## Air Squadron for Basra

THE R.A.F. Supermarine-Napier flying boats of No. 203 Squadron, were due to leave Cattewater, Plymouth, under the command of Group-Captain H. R. Busteed, on February 19, on the first stage to Basra, where they will be stationed. The start, however, has been postponed.

## French Long-Distance Flight Fails

CAPT. D. COSTES, the French pilot, who flew the South Atlantic with Lieut. Le Brix, left Paris on February 19 on a flight to Hanoi, French Indo-China. He crashed 20 minutes later at Bondy when making a forced landing owing to oil trouble. The machine, a Breguet 280T (600 h.p. Hispano) struck a telegraph post and was completely destroyed, but the three occupants were not seriously hurt.

## Paris-Saigon Mail Flight

M. PAILLARD and Lieut. Le Brix, the French airmen, are attempting a mail flight from Paris to Saigon, Indo-China. They started on February 19 in a Bernard cabin monoplane (450 h.p. Lorraine-Dietrich engine) and reached Tunis. After refuelling they resumed the flight towards Cairo. The proposed course is via Basra, Karachi, Allahabad thence via Bangkok.

## Air Rescues from Kabul Continue

FIFTY people, including 38 women and children and five Germans, one Persian, and two Afghans, were brought from Kabul to Peshawar, on February 11, by R.A.F. machines. On February 17, the R.A.F. conveyed by air 17 people from Kabul to Peshawar, comprising British, Indians, Italians, Germans and one Frenchman.

## R.A.F. Pilots Released by Afghans

FLT.-LT. C. R. HANCOCK managed to get away from Sultanpur near Jalalabad, on February 13, where he had been detained by the Afghans, after landing to pick up the other detained R.A.F. officers, Ftl.-Lt. Chapman and F./O. Davies. He flew back to Peshawar with F./O. Davies. On Feb. 18 Ftl. Lt. Chapman was rescued by air and flown to Peshawar.

## Commander Byrd's Expedition

THE supply ship *Eleanor Bolling* has left Dunedin, New Zealand, carrying the last cargo of equipment for Commander R. Byrd's Antarctic Expedition, in the Bay of Whales. This is its third trip.

## Air Mail to South Africa

IT is thought that the Union Government of South Africa will support the Imperial Airways scheme for a subsidised air service from Cairo to the Union to bring the Cape within a week's flight from London. Johannesburg may be the terminus for the machines and the mail distributed from there by local aircraft and trains.

## Non-Stop Round the World

COL. ART GOEBEL, the American pilot, is stated to be proposing a non-stop flight round the world in June. A Denver millionaire has offered £10,000 for this record, starting and finishing at Denver City, and following as closely as possible the 40th degree north parallel, where the distance round the world is about 19,000 miles. Col. Goebel plans to refuel in the air seven times and his machine will be a Sikorsky amphibian.

## Swedish Air Statistics

THE Aerotransport Co. of Stockholm, who own eight

Junkers all-metal monoplanes, four of which have three engines and four with single engines, report a reliability factor of 96.5 per cent. during the year 1928 with a load factor of 64 per cent. For the period of five years ending December, 1928, the results were: 1,509,480 kms. flown; 53,928 passengers carried; 264 tons of freight and mails carried, and reliability 94.3 per cent. There was no injury to a passenger.

## French Development in West Africa

A FRENCH machine, which has been prospecting for the new Franco-Belgian air line to the Congo and Madagascar, flew across the Sahara to Gao, on the Niger, in 8½ hours recently.

## Aircraft Invaluable in Denmark

COPENHAGEN'S only means of communication with the Continent to the south and Sweden to the north is by air, as the Straits are frozen. The weather conditions are the worst since 1893. Ten Danish military aeroplanes are to convey to Copenhagen 60 members of the Danish Government.

## Graf Zeppelin

THE proposed flight of the *Graf Zeppelin* to Egypt has been definitely cancelled. The reasons, it is suggested, are political, although there is no evidence that objections were made by this country. Apparently the German Foreign Office took the step resulting in the abandoning of the flight.

## London-India Service.

IMPERIAL AIRWAYS, LTD., have made alterations in the time-table for the London to India service, which is due to commence on March 30, to save more time. The machine will now leave Croydon each Saturday at 10.30 a.m. instead of 5.45 a.m. G.M.T., and the time of arrival at Karachi will now be 10.30 a.m. G.M.T. the following Friday. Therefore the journey will be flown in exactly six days, whilst the actual flying time will be 52 hours.

## German Air Negotiations

JUNKERS, the German aircraft manufacturing company, are opening negotiations with the Irak Government for an extension of their air line from Teheran to Baghdad instead of only to the frontier, which is the present terminus.

## Aircraft Defeats Winter

THE freezing of the lagoon at Venice has isolated the islands from steamers. Aircraft have been chartered to carry food to the islands and to isolated villages, schools, and farms.

## Irish Aviation

COL. JAMES FITZMAURICE, the airman who accompanied the late Baron von Huenefeld and Capt. H. Koehl on the east-to-west Atlantic flight in the "Bremen" monoplane, has resigned from the Irish Free State Air Force. It appears that he received many offers to enter commercial aviation after his flight, which he refused at the time. Recently, however, another opportunity attracted him. A group with very large resources has decided to establish a new transatlantic sailing route, with Halifax, Nova Scotia, and Galway as the terminal ports, which will be linked with the industrial centres of Europe and America by air services and train ferries. When developments are completed Galway Harbour will be able to accommodate the largest liners. It is significant that the North German Lloyd Co., to which Baron von Huenefeld was attached as publicity agent, have sent vessels to Galway on two or three occasions lately.

## America Scraps Aircraft Carriers

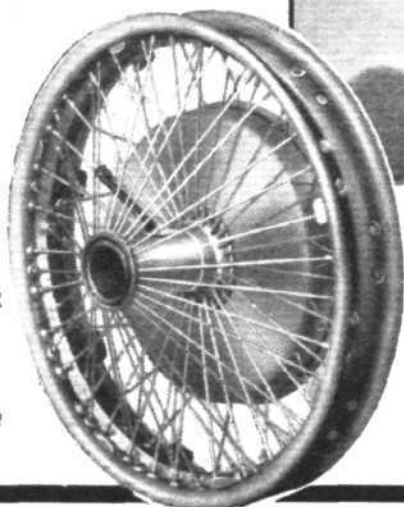
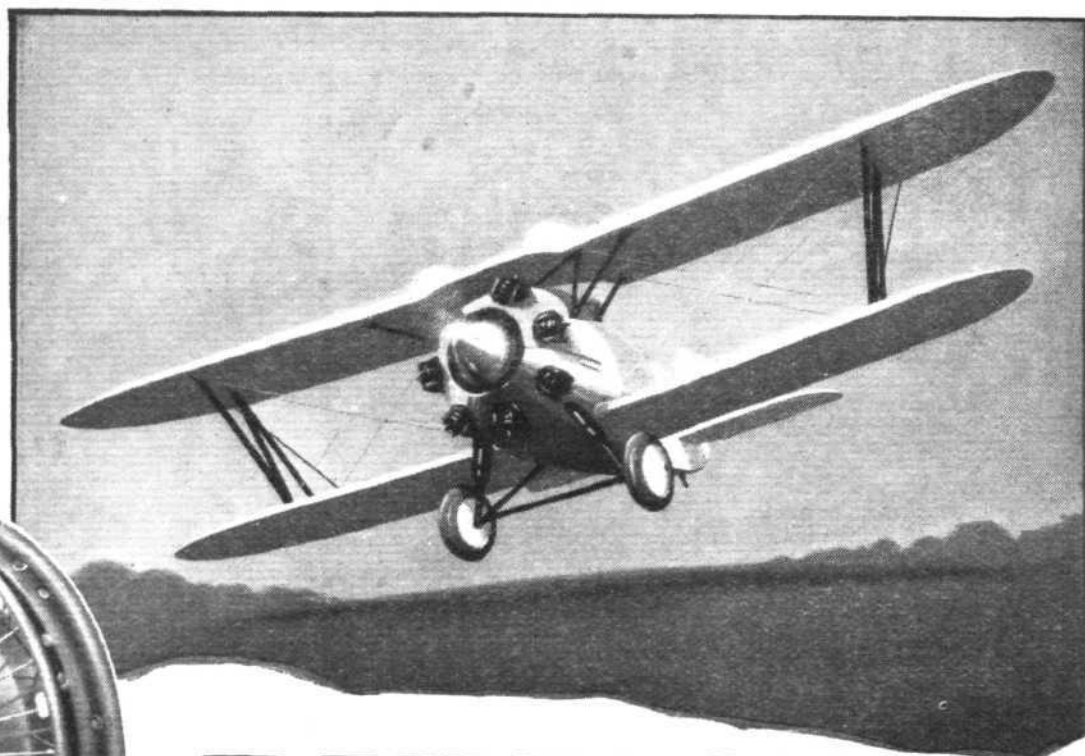
FIFTEEN months after being put into commission, at a cost of nearly £18,000,000, the two great American aircraft carriers, "Lexington" and "Saratoga," each of 33,000 tons, are to be scrapped, according to a Washington despatch.

## Air Mishap at Gibraltar

AN R.A.F. seaplane attached to H.M.S. *Vindictive*, while flying over Gibraltar, was forced to come down in the harbour. The two officers in the machine were rescued but are suffering from shock.



# Safe GROUND WORK on -



DUNLOP RUBBER  
CO. LIMITED,  
FORT DUNLOP  
BIRMINGHAM

Branches throughout  
the World.

# DUNLOP

Wired-Type Tyres on Dunlop Wheels  
and Well-Base Rims.

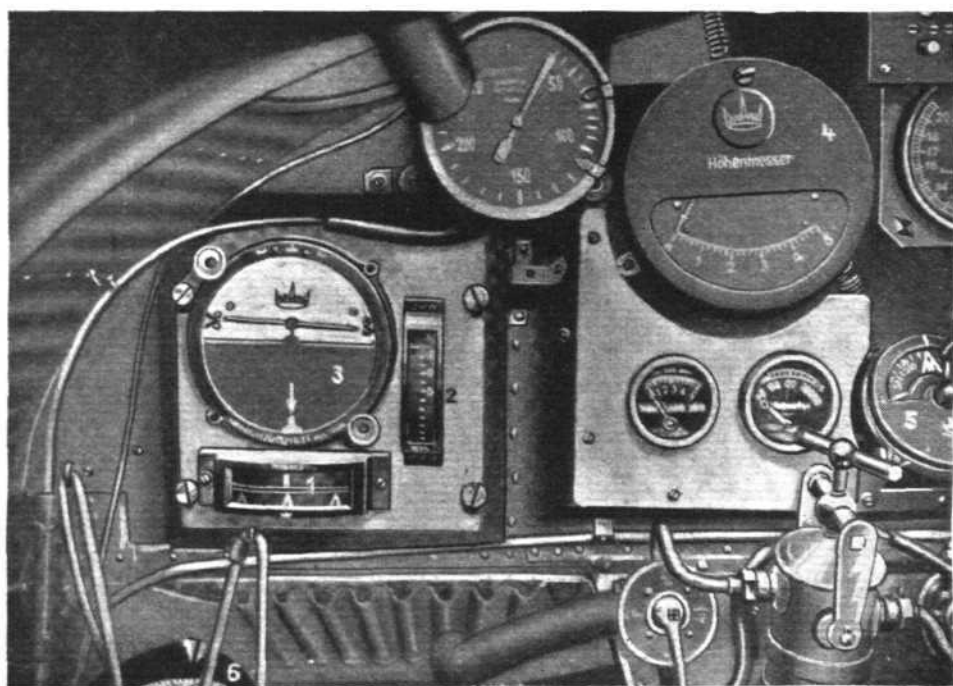
C.F.H. 597



[The Instrument-board of the **BREMEN**

Fitted with  
Askania-Instruments

1. Course Indicator.
2. Longitudinal Inclinometer.
3. Turn and bank indicator.
4. Altimeter.
5. Course - setter of the Telecompass.
6. Compass.



Please ask for  
Print Aero 44

**ASKANIA-WERKE AG.**

**BAMBERGWERK**  
**BERLIN-FRIEDENAU**  
KAISERALLEE 27/28

Save time by using the Air Mail.



# THE BRITISH RUSSELL "LOBE" PARACHUTE



## The "Russell-Lobe" Parachute and Adjustable Harness

Positive Action Packs  
Automatic and Free Functioning  
No Rubber or Elastic used to ensure opening  
No Wire Spring Fittings  
Highest quality silk used  
Re-packing perfectly simple  
Normal Speed of Descent  
Absence of Shock on opening  
Absence of Shock during descent

Manufacturers: E. R. CALTHROP'S AERIAL PATENTS LTD.

All communications to  
T. H. ROBERTS, Secretary and Treasurer.

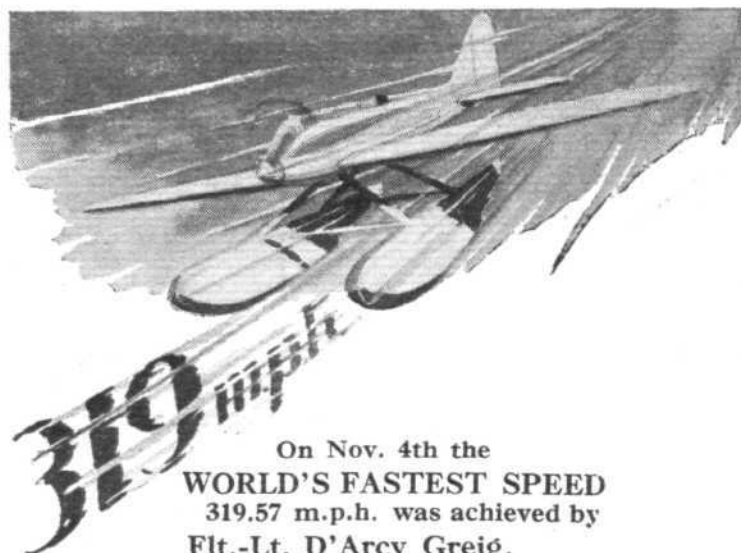
**THE BRITISH RUSSELL PARACHUTE CO., LTD.**

Registered Offices:

423/423a, EDGWARE ROAD, LONDON, W.2.

Telegraphic & Cable Address:  
"SAVEMALIVO, LONDON."

Telephone:  
PADDINGTON 6332



On Nov. 4th the  
**WORLD'S FASTEST SPEED**  
319.57 m.p.h. was achieved by  
Flt.-Lt. D'Arcy Greig,  
D.F.C., A.F.C., R.A.F.

flying a Supermarine  
Napier Seaplane using

**Pratts**

**Ethyl Petrol**

TRADE MARK

Distributed by the proprietors of PRATTS SPIRIT—famous for 30 years.

D.A.298.

*The Oldest and  
Only Office  
devoted entirely  
to Aviation Risks*

Claims paid to  
date **EXCEED**  
**£ 3 5 0, 0 0 0**

## BRITISH AVIATION INSURANCE GROUP

THE WHITE CROSS AVIATION INSURANCE  
ASSOCIATION

Subscribed by Underwriters at Lloyd's.

UNION INSURANCE SOCIETY OF CANTON, Ltd.  
Incorporated in Hong Kong. Established 1825.

Union Building, 78, 79, 80, Cornhill, London, E. C. 3  
Telephone . . . Avenue 8662 (four lines).  
Telegrams and Cables . . . "Unionist, London."

Underwriting Office, Lloyd's Building, 3-4, Lime St., E. C. 3  
Telephone . . . Avenue 9288.  
Telegrams and Cables . . . "Aviagroup, Stock, London."

Kindly mention "Flight" when corresponding with advertisers.

## IN PARLIAMENT

### Afghanistan and Kabul Evacuations

SIR A. CHAMBERLAIN, on February 13, in reply to Mr. Day, said the following men, women and children were evacuated from Kabul by the Royal Air Force between December 23, 1928, and February 11, 1929:

British subjects, 216; Afghans, 32; French, 11; Germans, 34; Italians, 4; Persians, 19; Roumanians, 1; Swiss, 1; Syrians, 5; Turks, 42; United States citizens, 1. Making a total of 366, of whom some 280 were women and children.

### Air Services in Africa

VISCOUNT SANDON asked the Secretary of State for Air what steps are being taken to avoid the imminent monopoly of air transport and development throughout Africa by France and Belgium; and whether any British exploitation is to be anticipated immediately?

SIR S. HOARE: I am aware that proposals are on foot for the establishment of new French and Belgian air services in West Africa, but I do not think there is any likelihood of their adoption resulting in the monopoly feared. Imperial Airways should be operating a service between London and Alexandria by about April 1, and I hope that this air service may be supplemented before long by another between Egypt and the Cape, proposals for which I am already considering.

### Bombing Accident

MR. WARDLAW-MILNE asked the Under-Secretary of State for India whether he has now received a full report upon the Peshawar bombing accident and, if so, if he will give the contents and the result of the inquiry made into the occurrence?

EARL WINTERTON: The following is the text of a statement made on the subject in the Indian Legislative Assembly on February 11.

His Excellency the Commander-in-Chief has received and considered the report of the Court of Inquiry appointed to investigate the terrible accident that occurred at Peshawar on January 23. The story of the accident is as follows:

Bombing practice with live bombs is part of the normal training in units of the Royal Air Force and is regularly carried out by them over areas of ground which are reserved as bombing ranges in the same way as artillery and rifle ranges are reserved for use by artillery and troops of the line. There is a bombing range in the neighbourhood of Jamrud, which is used by the Royal Air Force stationed in Peshawar. It had been decided by the local Air Force authorities that bombing practice should be carried out on this range on January 21, 22, 23, and 25. On such occasions the Royal Air Force unit concerned is responsible for taking certain preliminary steps. It has to notify the district magistrate and obtain from him a statement that there is no objection to bombing taking place on the range on the dates mentioned. It has further to notify the superintendent of police, the Tehsildar and the local military headquarters, in order that human beings and cattle may be safely cleared off the ground before practice begins, and in order that both the civil and military authorities in the station may be made aware of the fact that bombing is to take place. All these precautions were duly complied with on January 12, by the officer commanding No. 20, Army Co-operation Squadron, the unit of the Royal Air Force concerned; and, in addition, a copy of the notice was sent direct to the officer commanding, Poona Horse, as that regiment would be required in accordance with the usual procedure, to provide four troopers and a non-commissioned officer to help in clearing the danger area of human beings and cattle at the times and on the dates mentioned. Notice of bombing practice appeared in the ordinary course in the local military orders of January 16.

Some days later it was decided at short notice by the local armoured car authorities to allow, for the benefit of an Inspecting Officer, a technical exercise which had been carried out by an armoured car company over a large area, which included the Royal Air Force bombing range, on January 11. A feature of this exercise on both occasions was that a squadron of cavalry should enact the role of a party of raiders supposed for the purpose of the exercise to be escaping from Peshawar over the border. It was the function of the armoured car company engaged in this exercise to cut off the supposed raiders before they could have made their way into tribal territory. Arrangements were accordingly made by the Officer Commanding, Armoured Car Company, in Peshawar through the authorities concerned, for the repetition of the tactical exercise which I have described to take place on January 23, which was the third of the dates already notified for bombing practice by the Royal Air Force on their bombing range. On the morning of the 23rd, the "Safeties" that is the officer of the Royal Air Force who was detailed to supervise the clearing of the bombing range for live bomb practice, went down early to the range where he met the four Sowars and the non-commissioned officer, who had been sent to help him. It was raining and the lorry which should have brought the Air Force personnel required for duties on the ground during the bombing practice, as well as the signals which are used on such occasions, had not arrived. The Safety Officer thereupon went back to the aerodrome at Peshawar, a distance of four miles, on his bicycle. He found the delay to have been due to the fact that the weather conditions were not very good, and that it had not yet been decided whether the bombing practice would take place that morning or not. While he was there, a machine was sent up to test the weather. The Safety Officer was meanwhile told to return to the range and clear it, and, if no bombing had taken place by 10.30 to pack up and return.

This was at about 9 a.m. The Safety Officer accordingly returned to the

bombing range, this time in a tender, accompanied by two armourers and an Indian driver, taking with him the signals required on the range. He made his preparations for clearing the range, and sent out Sowars to remove any cattle and human beings that might be on the ground. At that moment "C" Squadron Poona Horse, which had been detailed for the tactical exercise appeared with two British officers, neither of whom appears to have known that bombing practice was to take place that day. The party were anxious to get across to the other side of the bombing range in order to carry out their part in the exercise. After some colloquy, the Safety Officer agreed to the squadron crossing the ground as there was ample time for it to do this before the range was cleared. The squadron accordingly moved off, led by the two British officers, to cross the range. Meanwhile the Safety Officer proceeded to lay out upon the ground a signal which would be read by any aeroplane coming over the bombing range and which means "await further signal: do not bomb." He had only just finished doing this when a bomb fell from an aeroplane on to the squadron which was now some distance away, but still crossing the danger area. The officer who was piloting the aeroplane had arrived immediately before at a height of 4,000 ft. over the bombing range, and had mistaken the signal to wait for the signal which means "all clear." This officer had, it would seem, good reason to suppose that the ground would have been cleared by the time that he arrived. The men of the squadron were dressed in khaki overcoats, as it was raining, and wore white turbans. They were not seen by either of the two occupants; and a very careful reconstruction of the accident convinced the Court of Inquiry that a squadron thus clad could not have been seen from that altitude in the conditions prevailing.

Both occupants had their eyes fixed on the target from which the squadron was then about 200 yards distant. The bomb over-shot the target and, falling as it did upon the squadron in close formation, caused fearful havoc. Three Indian officers and 10 non-commissioned officers and Sowars were either killed on the spot or succumbed to their injuries the same day; 12 non-commissioned officers and Sowars were injured, of whom three subsequently died in hospital. Sixteen horses were killed. Fifteen were injured and had to be destroyed. Medical aid was rushed to the spot as soon as possible, and everything that could be done for the injured was done. The next-of-kin of the deceased were informed without delay, both by telegraph and by letter, and shortly afterwards messages of sympathy from His Excellency the Viceroy, the Secretaries of State for India, War and Air, His Excellency the Commander-in-Chief, the General Officer Commanding-in-Chief, Northern Command, and the Air Officer Commanding the Royal Air Force in India were received and conveyed to them.

The Government of India considered immediately the question whether special compensation or gratuities should be paid to the heirs of those who were killed, and also to those who were permanently injured. Under the ordinary rules both these categories are entitled to pensions on an adequate scale, and pensions will be issued in the ordinary course. In addition, the Government of India have decided to grant to the heirs of the three Indian officers who have been killed gratuities on the same scale as are admissible when death is caused by active service, namely, Rs. 1,200 to the heirs of Risaldars, and Rs. 600 each to the heirs of Jamadars. They are also sanctioning gratuities of Rs. 200 each to the heirs of non-commissioned officers and Sowars. For such of the injured as may have to be discharged to pension, they are sanctioning disability pensions at a special rate instead of the ordinary rate.

From information at present before them, Government are provisionally of the opinion that the following were the principal contributory causes of the accident:

First, the fact that certain authorities who had at different times received information both of the forthcoming bombing practice on January 23, and of the intended tactical exercise which was to be held in the vicinity on the same day, failed to connect these two events in their minds. It was this failure of memory and co-ordination that in the first instance apparently rendered the accident possible.

Secondly, the despatch of the bombing aeroplane over the range before there had been time to clear the range.

Thirdly, the mistaking of the warning signal for the signal that all was clear.

The Court of Inquiry has found certain officers to blame in connection with the causes that I have mentioned. His Excellency the Commander-in-Chief has most carefully considered the proceedings of the Court of Inquiry and the opinions of the local commanders, and has decided that summaries of evidence should be prepared with a view to the trial of certain officers by court-martial. To some extent, the disaster may be found attributable to a combination of mischances against which no amount of forethought could have prevailed. On the other hand, it may be found due also to failure in judgment on the part of individuals or to some defect in the prescribed system of safeguards. I would ask the hon. members of this House and through them, the press and public, not to form too hasty conclusions, and above all not to express opinions or conjectures that might in any way prejudice the judicial proceedings.

I need hardly add that the sympathies of the Government and, I am sure, of the whole House, go out to the men who have been disabled, and to the widows and children of those who have perished so tragically and so suddenly in the prime of their lives and in the performance of their duty.

### New R.A.F. College

CONSTRUCTION is beginning on the new R.A.F. Cadet College at Cranwell. This was provided for in the Air Estimates of the current financial year.

### Lecture on R.A.F. Far East Flight

THE first of the lectures which Group Capt. Cave-Brown-Cave will give in connection with the recent R.A.F. Flying-boat Cruise to the Far East will be read before the Royal Aeronautical Society (and Institute of Aeronautical Engineers) on March 4 next. The title of the lecture will be "The Royal Air Force Far East Flight," and it will deal with the technical problems of the flight. It will be illustrated with a large number of photographs, many of which have not been shown before. Will those who wish to attend make a special note that the lecture will take place (at 6.30 p.m.) in the

Lecture Hall of the Institute of Electrical Engineers, Savoy Place, Victoria Embankment, London, W.C.2, and *not* at the Royal Society of Arts.

### Celebration of Bleriot's Channel Flight

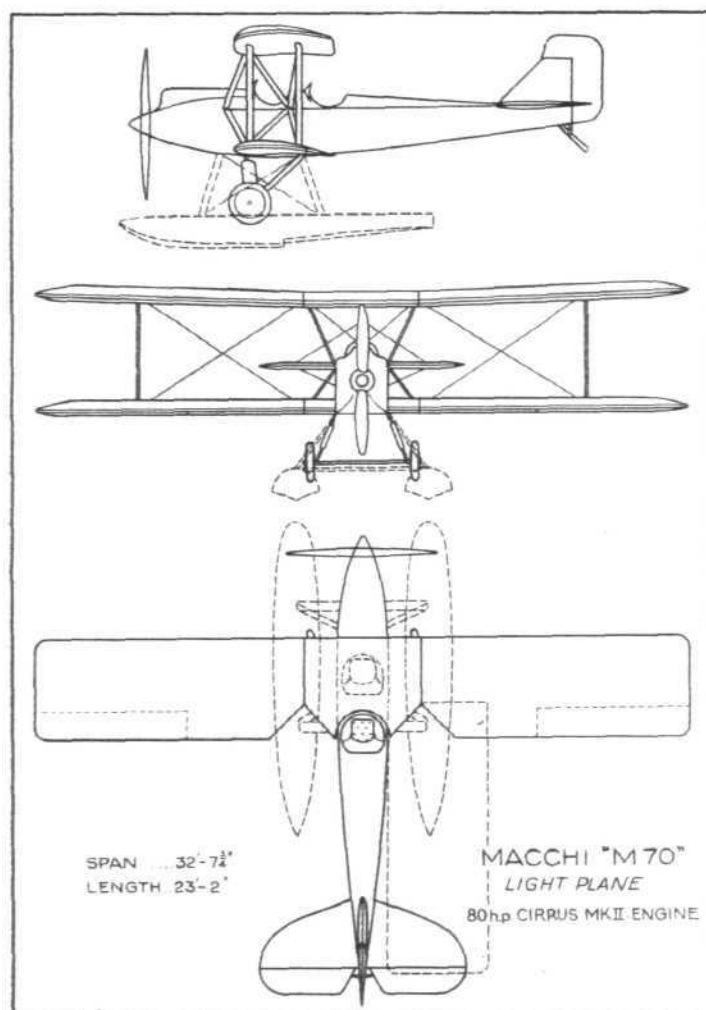
IN view of the great progress now made by aviation, it is difficult to realise that it is not yet 20 years since the first cross-Channel flight was made by Bleriot. The anniversary of this event is to be celebrated at Calais on July 25 by fêtes organised by the Aero Club de France and the Ligue Aeronautique de France. The occasion is also to be marked by the issue of a propaganda stamp designed by M. Henry Sarusard, president of the Aeronautical Society of the Pas de Calais. The design shows on the right the rising sun, and on the left the sea and cliffs of Dover, with Bleriot's machine on its way towards England. Beneath this design appears the single word: "Bleriot."

# AEROPLANE TYPES

## The Macchi "M-70"

A TWO-SEATER light biplane constructed by Aeronautica Macchi, of Varese, Italy, fitted with a 75-80 h.p. "Cirrus II" engine.

*Special Features.*—Convertible to either land- or sea-plane. Folding wings.



THE MACCHI "M.70": General arrangement drawings.

*Wings.*—Are of orthodox wooden construction, with fabric covering, having a fairly thick wing-section. Single bay bracing, the top plane being set at a dihedral angle of about  $2\frac{1}{2}^\circ$ , while the lower plane is horizontal. The top plane is in three sections, comprising a centre section—the span of which is somewhat wider than the fuselage—supported by a pair of N-struts sloping outwards, and two outer sections which are attached by hinged joints to the centre section. The lower plane, which has the same span as the top, is similarly divided, except that the lower centre section is in the form of two wing roots attached to the fuselage and braced therefrom by N-struts. The usual external piano-wire bracing is employed, and the interplane struts are steel tubes, faired. The upper and lower outer sections hinge on the rear spar attachments so as to fold back along the fuselage; when folding a false strut is inserted between upper and lower planes on the front spar roots of the outer sections. Unbalanced ailerons are fitted to the lower plane only.

*Tail Surfaces.*—Of monoplane type, with steel frames, covered with fabric. The rudder is balanced, but not the elevators.

*Fuselage.*—This is of usual rectangular section, with two open cockpits in tandem. It is of wood construction with plywood covering. The rear cockpit is normally the pilot's, but each cockpit is provided with a control, the front one being disconnected at will from the rear one.

*Undercarriage.*—Conventional V-type with straight axle. The front struts of each V embody a rubber disc (in compression) shock absorber. For the seaplane model, two long single-step floats, carried by four struts, replace the wheel undercarriage.

*Power Plant, &c.*—The 75-80 h.p. "Cirrus II" engine, or similar type, is mounted in the nose and drives a tractor airscrew 6.7 ft. diameter by 3.4 ft. pitch. The fuel tank is located in the top centre section, giving gravity feed.

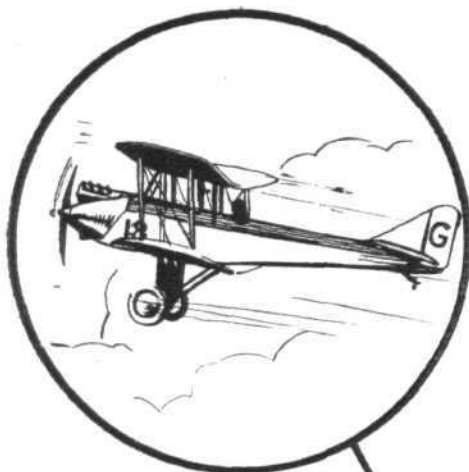
### Specification.—

Span .. .. .	32 ft. 7 $\frac{1}{2}$ in. (9.95 m.).
Chord .. .. .	5 ft. 0 in. (1.50 m.).
Length .. .. .	23 ft. 2 in. (7.06 m.).
Height .. .. .	9 ft. 7 in. (2.95 m.).
Wing area .. .. .	305.5 sq. ft. (28.4 sq. m.).
Weight, empty .. .. .	1,014 lbs. (460 kg.).
Total weight .. .. .	1,632 lbs. (740 kg.).
Wing loading .. .. .	5.3 lbs./sq. ft. (26 kg./sq. m.).
Power loading .. .. .	21 lbs./h.p. (9.5 kg./h.p.).
Speed range .. .. .	34-96 m.p.h. (55-155 k.p.h.).
Climb to 3,280 ft. (1,000 m.) .. .. .	7 mins.
Climb to 13,120 ft. (4,000 m.) .. .. .	53 mins.
Ceiling .. .. .	15,080 ft. (4,600 m.).
Duration .. .. .	5 hours.



THE MACCHI "M.70": Three-quarter rear view of the Italian light biplane. It is fitted with a "Cirrus II." or similar type engine, and can be converted into a seaplane.





# TITANINE

*The World's Premier*

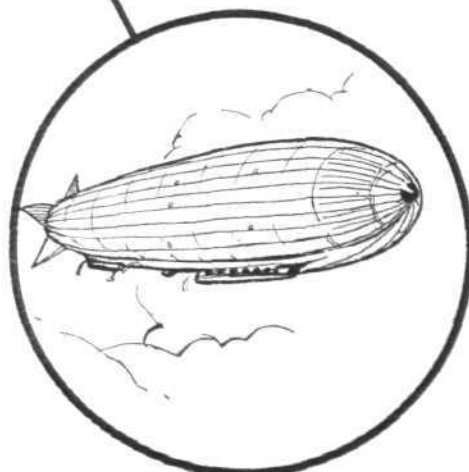
# DOPE

**TITANINE-EMALLITE LTD.**

**HEAD OFFICE: Empire House, 175 Piccadilly,  
LONDON W.1.**

**WORKS:**  
Hendon (LONDON NW9)  
New Jersey (U.S.A.)  
Milan (ITALY)  
Bremen (GERMANY)

**TELEGRAMS & CABLES:**  
"Tetrafree" PICCY LONDON  
Codes: ABC 5<sup>TH</sup> EDITION  
& BENTLEY'S



*Save time by using the Air Mail.*

# CIRRUS AERO ENGINES LTD., Manufacturers of **CIRRUS AERO ENGINES**

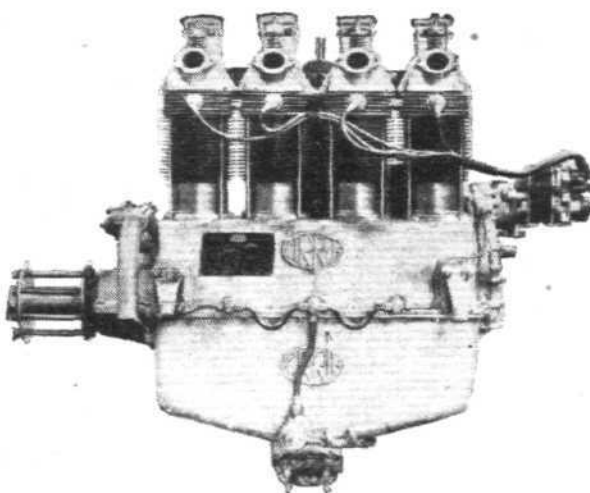


## Use and Recommend Wakefield **CASTROL** Motor Oil

The CIRRUS Engine illustrated is the MARK III type of 85/95 h.p.

CIRRUS Engines are famous for their reliability and they are in daily use all over the world, in addition to possessing a remarkable record of outstanding successes in Air Racing, World Flights and International Competitions.

A CIRRUS Engine enabled Sqd. Ldr. Hinkler to carry out his wonderful record flight from London to Australia in 15½ days, and they are fitted in twenty-seven different types of light aeroplanes.\*



"It gives us much pleasure to record our satisfaction with Wakefield CASTROL Motor Oil, which is used to lubricate all the CIRRUS Aero Engines built and tested at our Works.

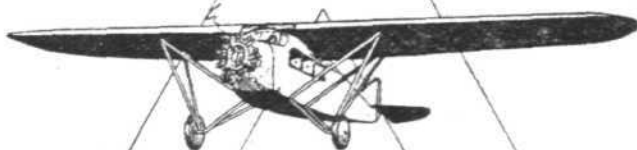
"We recommend the use of Wakefield CASTROL XXL to lubricate CIRRUS Aero Engines in normal use and Wakefield CASTROL R for racing purposes."

Statement by  
**Cirrus Aero Engines, Ltd.**  
 89, Kingsway, London.

C. C. WAKEFIELD & CO., LTD., All-British Firm, Wakefield House, Cheapside, London, E.C.2

A. LEVILL  
 1920

### THE SIGN OF SAFETY



# R · O · P ·

## AVIATION SPIRIT.

### RUSSIAN OIL PRODUCTS LTD.

MOORGATE HALL, LONDON, E.C.2.

PHONE: LONDON WALL 9204-5.

Kindly mention "Flight" when corresponding with advertisers.

# THE ROYAL AIR FORCE

London Gazette, February 19, 1929.

## General Duties Branch

Sec. Lieut. K. A. K. MacEwen, S.R., Argyll and Sutherland Highlanders, is granted a permanent commn. as a Pilot Officer with effect from and with seniority of Jan. 25; L. V. G. Barrow is granted a short-service commn. as a Pilot Officer on probation, with effect from and with seniority of Feb. 5; Pilot Officer on probation L. S. Snaith is confirmed in rank (Dec. 30, 1928).

The follg. Pilot Officers are promoted to the rank of Flying Officer:—D. I. Stewart, A. T. C. Hazledine, C. P. Barker (Jan. 1); G. R. Jackson, A. R. Combe, L. M. Woolveridge (Jan. 18).

Flight-Lieut. J. L. K. Pearce, O.B.E., is placed on Retd. List at his own request, and is granted permission to retain rank of Squadron Leader (Feb. 14); Flight-Lieut. A. E. Dark is placed on Retd. List (Feb. 17); Flying Officer H. Buxton is placed on Retd. List at his own request (Feb. 20).

The follg. are transferred to Reserve:—Class A.—Flying Officer G. W. R. Russell (Feb. 18); Flying Officer H. C. Lee (Feb. 20). Class B.—Flight-Lieut. R. F. Durrant, A.F.C. (Feb. 17).

Pilot Officer on probation A. H. Westwood relinquishes his short-service commn. on account of ill-health (Feb. 20).

## RESERVE OF AIR FORCE OFFICERS

### General Duties Branch

The follg. Pilot Officers are promoted to rank of Flying Officer:—D. H. F. Barnett, M. G. Candy, P. Drummond (Feb. 15); E. Batchelor (Feb. 16).

The follg. Flying Officers are transferred from Class C to Class A:—F. A. Pumphrey, D.C.M. (Feb. 4); J. C. Overal (Dec. 26, 1928). Pilot Officer on probation E. M. Badley relinquishes his commn. on account of ill-health (Jan. 9). Pilot Officer L. V. G. Barrow relinquishes his commn. in the Special Reserve on appt. to a short-serv. commn. (Feb. 5).

## ROYAL AIR FORCE INTELLIGENCE

**Appointments.**—The following appointments in the Royal Air Force are notified:—

### General Duties Branch

**Flight Lieutenants:** W. F. Dickson, D.S.O., A.F.C., to No. 2 (Indian Wing) Station, 12.2.29. V. E. Groom, D.F.C., to No. 3 (Indian Wing), 12.2.29. E. J. Kingston-McCloughry, D.S.O., D.F.C., to H.Q., India 12.2.29.

**Flying Officer** G. J. Davies to No. 1 School of Tech. Training (Apprentices), Halton, 8.1.29.

**Pilot Officers:** M. V. de Satge, to R.A.F. Depot, Uxbridge, on appointment to a Short Service Commn., 1.2.29. M. V. de Satge, to No. 27 Sqdn., India, 12.2.29. A. M. Cowell and A. Haywood, to R.A.F. Depot, Uxbridge, 12.2.29. E. J. Brighton, to Night Flying Flight, Biggin Hill, 12.2.29. A. D. Jaffe,

to No. 9 Sqdn., Mauston, 12.2.29. D. B. McGill and R. V. Redpath, to No. 7 Sqdn., Worthy Down, 12.2.29.

### Stores Branch

**Flying Officers:** G. C. Wilson, to No. 100 Sqdn., Bicester, 29.1.29. H.M.S. Dawes, to No. 605 Sqdn., Castle Bromwich, 4.2.29. M. S. Shapcott and W. G. S. Wood, to Aircraft Depot, India, 12.2.29.

### Medical Branch

**Flight Lieutenant (Dental):** W. Wormington, to R.A.F. Depot, Uxbridge, on appointment to a Temp. Commn., 1.2.29; to R.A.F. Combined Hospital Aden, 9.2.29.

## AIR MINISTRY NOTICE TO GROUND ENGINEERS

### Flexible Stranded Cables in Flying Controls

1. It has been found that cables of four strand construction, e.g., 4 × 19, wear rapidly in aircraft flying control systems, especially at those points where the cables are protected by Bowden sheathing, the cause of this being the relative movement of cable and sheathing.

2. Existing cables of 4 × 19 construction are to be examined immediately, and for this purpose any protective sheathing is to be moved so that the whole of the cable can be seen. If there are any signs of wear the cable is to be replaced forthwith in accordance with para. 3 of this Notice. Any 4 × 19 cable not required to be so replaced is to be frequently examined, and any Bowden sheathing is to be moved on each of these occasions to enable the covered portions of the cable to be examined.

3. In future the cable used in flying control systems must be of the 7 × 19 type to current B.E.S.A. specification, and no Certificate of Airworthiness will be issued or renewed unless cables of this type have been fitted.

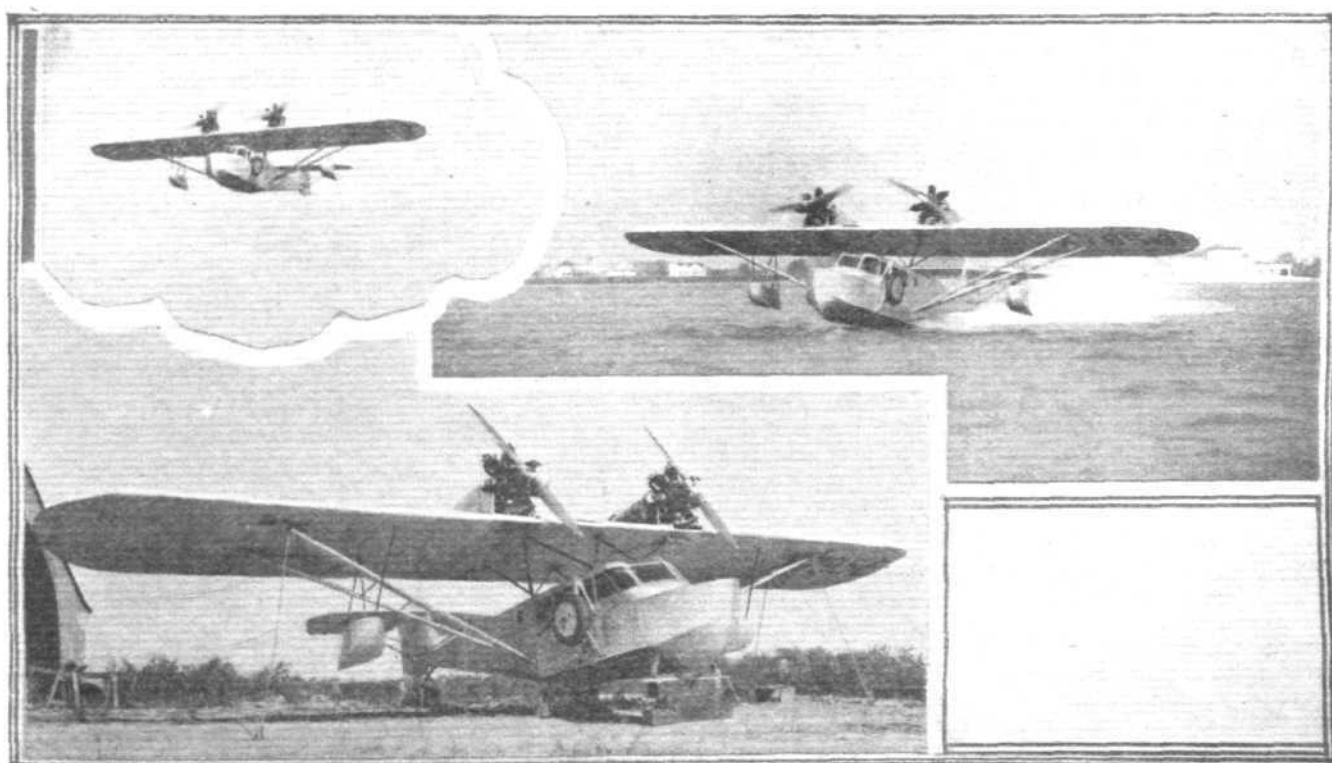
4. Cables of the type mentioned in para. 3 above that are protected at points by Bowden sheathing should also be examined immediately by moving the sheathing so that the whole of the covered portion can be seen, and this operation must be repeated on each occasion that an aircraft is inspected for renewal of Certificate of Airworthiness.

No. 6 of 1929.

✻ ✻ ✻ ✻

## The Royal Air Force Memorial Fund

The usual meeting of the Grants Sub-Committee of the Fund was held at Iddesleigh House, on February 14. Lieut.-Commander H. E. Perrin was in the chair, and the other members of the committee present were Mrs. L. M. K. Pratt-Barlow, O.B.E., and Sqdn.-Ldr. Douglas Iron, O.B.E. The committee considered in all 15 cases, and made grants to the amount of £222 5s.



**THE TOWEL AMPHIBIAN:** Three views of a new American amphibian flying-boat constructed by the Towel Marine Aircraft Engineering Co., of Detroit. It has a metal hull and accommodates four passengers. The wing span is 52 ft.; the overall length 33 ft., and the weight, empty, 2,750 lbs., and fully laden, 4,420 lbs. Powered with two 150 h.p. "Comet" (Aircraft Engine Co.) engines, it has a speed range of 45-115 m.p.h.



### "STAYBRITE" AT BIRMINGHAM FAIR

As is only natural, Stainless and Staybrite steels will be the prominent exhibits on the Stands Nos. 10F/1 and 10G/1 of Thos. Firth & Sons, Ltd., Sheffield, at the British Industries Fair, Birmingham.

So rapid has been the development of "Firth Staybrite" steel, particularly, that ingots weighing 25 tons have to be produced to keep pace with the demand. The applications of this super-rustless and acid-resisting steel will be demonstrated in innumerable forms ranging from dyeing machines to spoons, forks and tableware and from pump impellers to cigarette cases and household equipment of all kinds.

Attention is fast being focussed upon the economies attendant upon the use of polished sheets of "Firth Staybrite" as the starting point in the manufacture of many articles which require piercing, pressing or stamping.

Many examples of articles produced in this way will be shown, together with polished sheets in the various finishes obtainable from the Blackheath works of the company.

Firth's other specialities such as their special alloy steels, which have played an important part in regaining the Schneider seaplane trophy for Great Britain and in certain world's speed records held by Malcolm Campbell, will also be shown together with a range of products from the Firth engineers' tool department.

\*\*\*

### New Westland Monoplane Tested

THE Westland Aircraft Co., Ltd., of Yeovil, have successfully tested their new passenger monoplane which accommodates four passengers and the pilot, and is driven by three A.D.C. "Cirrus Mark III" engines. It is able to fly and climb on any two of the three engines.

### "Cirrus" News

DURING the month of January the A.D.C. Aircraft Co., Ltd., supplied twenty "Cirrus Mark III" engines for installation in Avro "Avians" for despatch to China. Capt. E. W. Percival, who gained second place in the light 'plane trials at Orly (France) last September with his Cirrus-Avian, is now on his way back to Australia and in a letter he wrote that his machine did approximately 100 hours during his visit to Europe, which included trips to Berlin, France and the Air Force squadrons in England, and the "Cirrus Mark III" required no attention beyond one or two valve adjustments.

### The Bristol "Jupiter" in America

THE Bristol Aeroplane Co., Ltd., of Filton, informs us that a "Bristol" Jupiter, Series VI.A.L. (5 to 1 compression ratio), engine No. J.6409 was recently submitted to type test at the U.S.A. Naval aircraft factory at Philadelphia. The official report states:—

"The 'Bristol' Jupiter engine successfully completed calibration and 50-hour endurance tests on December 1, 1928, without breakdown or replacement of parts. The test was conducted under Specification E.4.F, the last 5 hrs. being run at full throttle.

The maximum corrected brake horse-power developed was 460 at 1765 r.p.m.

The average specific fuel consumption at full throttle was 0.559 lbs. per brake horse-power hour.

The specific dry weight of the engine was 1.74 lbs. per h.p.

The corrected brake mean effective pressure was 119.5 lbs.

The best specific fuel consumption obtained was 0.484 lbs. per b.h.p.-hr. on the propeller load at 1,585 r.p.m."

News is also to hand that a "Bristol" Jupiter Series XI geared engine has also completed a type test in U.S.A. The "Bristol" Jupiter engine is now being manufactured under licence in the United States of America by the well-known E. W. Bliss Co. of Brooklyn, New York. Incidentally, it may be mentioned that the Jupiter engine has completed official type tests in practically every country in the world in which such tests are imposed.

### Blackburn Aircraft for America

THE Blackburn Aeroplane and Motor Co., Ltd., of Leeds and Brough, Yorkshire, have formed a combination with an American group of financiers. A company called the Blackburn Aircraft Corporation of America will be created with the right to manufacture all the Blackburn designs for flying-boats, seaplanes, and light aeroplanes. A capital of \$10,000,000 will be raised for this development, and it is proposed to operate large flying-boat services from the southern end of North America to South America as far as Rio de Janeiro and Buenos Aires, using the chain of West Indian Islands as a connection between the two continents. This preference given for the Blackburn designs was decided upon after the American group had made an exhaustive tour of Continental manufacturers of flying-boats.

### IMPORTS AND EXPORTS

AEROPLANES, airships, balloons and parts thereof (not shown separately before 1910.)

For 1910 and 1911 figures see FLIGHT for January 25, 1912.

For 1912 and 1913, see FLIGHT for January 17, 1914.

For 1914, see FLIGHT for January 15, 1915, and so on yearly, the figures for 1927 being given in FLIGHT, January 19, 1928.

	Imports.		Export.		Re-exports.	
	1928.	1929.	1928.	1929.	1928.	1929.
Jan. ..	1,220	2,852	157,598	74,307	330	100

\*\*\*

### PUBLICATIONS RECEIVED

*Technical Notes*: No. 294.—Wind Tunnel Force Tests in Wind Systems Through Large Angles of Attack. By C. J. Wenzinger and T. A. Harris. August, 1928. No. 295.—The Effect of Tip Shields on a Horizontal Tail Surface. By P. V. Dronin, E. I. Ramsden, and G. J. Higgins. August, 1928. No. 296.—Bearing Strength of Wood under Steel Aircraft Bolts and Washers. By G. W. Trayer. October, 1928. No. 297.—Preliminary Report on the Flat-Top Lift Curve as a Factor in Control at Low Speed. By M. Knight and M. J. Bamber. September, 1928. No. 298.—The Determination of Several Spray Characteristics of a High-speed Oil Engine Injection System with an Oscilloscope. By C. W. Hicks and C. S. Moore. September, 1928. No. 299.—The Effect of Fillets between Wings and Fuselage on the Drag and Propulsive Efficiency of an Airplane. By M. N. Gough. October, 1928. No. 300.—The Variation in Pressures in the Cockpit of an Airplane in Flight. By T. Carroll and Wm. H. McAvoy. November, 1928. No. 301.—Drag and Cooling with Various Forms of Cowling for a "Whirlwind" Engine in a Cabin Fuselage. By F. E. Weick. November, 1928. U.S. National Advisory Committee for Aeronautics, Washington, D.C., U.S.A.

*The Alexander Aircrafter*, January, 1929. Alexander Aircraft Co., Alexander Industries Building, Colorado Springs, Colorado, U.S.A.

*Air Transportation*. American Aeronautical Corporation, 730, Fifth Avenue, New York, U.S.A.

\*\*\*

### AERONAUTICAL PATENT SPECIFICATIONS

(Abbreviations: Cyl. = cylinder; i.c. = internal combustion; m. = motor. The numbers in brackets are those under which the Specifications will be printed and abridged, etc.)

#### APPLIED FOR IN 1927

Published February 21, 1929

- 28,511. BRISTOL AEROPLANE CO., LTD., and L. G. FRISE. Control surfaces for aircraft, etc. (304,815.)  
34,397. AIRSHIP GUARANTEE CO., LTD., and C. D. BURNEY. Lighter-than-air aircraft. (304,889.)

#### APPLIED FOR IN 1928

Published February 21, 1929

615. ETABLISSEMENTS AIR-SECURITE. Propulsion control systems for aircraft. (283,229.)  
4,612. F. H. ROYCE. Electrical turning-gear for starting i.c. engines. (304,933.)  
13,506. E. F. ALBERT. Wings for aeroplanes, etc. (304,973.)  
16,218. C. E. OUTURQUIN. Air propellers. (299,387.)  
18,352. L. BLERIOT. Aeroplanes. (293,303.)  
20,622. Dr. A. EHRLICH. Aircraft with swinging wings. (304,996.)  
20,695. A. HALL-BROWN, E. W. JONES and BABCOCK and WILCOX, LTD. Control-gear for airship mooring-tower heads. (304,997.)  
22,666. F. KRUPP AKT.-GES. Method of manufacturing twisted metal bodies, such as propeller blades, etc. (295,633.)

## FLIGHT,

The Aircraft Engineer and Airships

36, GREAT QUEEN STREET, KINGSWAY, W.C.2.

Telephone: Holborn 3211.

Telegraphic address: Truditur, Westcent, London.

### "FLIGHT" SUBSCRIPTION RATES.

UNITED KINGDOM

ABROAD\*

	s.	d.		s.	d.
3 Months, Post Free..	7	7	3 Months, Post Free..	8	3
6 "	15	2	6 "	16	6
12 "	30	4	12 "	33	0

\* Foreign subscriptions must be remitted in British currency.

Cheques and Post Office Orders should be made payable to the Proprietors of "FLIGHT," 36, Great Queen Street, Kingsway, W.C.2, and crossed Westminster Bank.

Should any difficulty be experienced in procuring "FLIGHT" from local news-vendors, intending readers can obtain each issue direct from the Publishing Office, by forwarding remittance as above.

## MISCELLANEOUS ADVERTISEMENTS.

All Advertisements for this column should arrive at this office by Tuesday, 12 o'clock noon, to insure insertion. Special PREPAID Rate:—

18 WORDS or less, 3/-, then 2d. per word

Display Caps Throughout, 1/6 per line.  
Situations Wanted ONLY, 18 Words, 1/6.  
1d. per word after.

## PATENTS.

STANLEY, POPPLEWELL & FRANCIS, International Patent Agents, Jessel Chambers, 98, Chancery Lane, London, W.C.2. Telephone: Holborn 6393; Telegrams: "Notions, London."

A. P. THURSTON, D.Sc., M.I.Mech.E., M.I.A.E., F.R.Ae.S.

PATENTS, Trade Marks and Designs.—Bank Chambers, 329, High Holborn, W.C.1 Holborn 2542.

## AIR SURVEY.

THE AIRCRAFT OPERATING CO., LTD., 8, New Square, Lincoln's Inn, London (Holborn 8131), and Bulawayo, Southern Rhodesia; Cairo, Egypt; Rio de Janeiro, South America. Contractors to the Ordnance Survey. Laboratories and Subsidiary Company for aerial photography in the British Isles, AEROFILMS LTD., Colindale Avenue, Hendon. (Colindale 6157.)

AIR SURVEY CO., LTD., 39, Grosvenor Place, S.W.1 (loane 6048), Monkey Point, Rangoon, and 12, Hungerford Street, Calcutta.

## AVIATION INSURANCE.

FOR INSURANCES of Every Description connected with Aviation, apply to BRAY, GIBB & Co., LTD., 166, Piccadilly, London, W.1. Enquiries welcomed.

## CONSULTANTS.

THE Design and Production of "Lighter-than-Air" craft is a speciality of THE AIRSHIP DEVELOPMENT CO., LTD., 39, Victoria Street, S.W.1, Aeronautical Engineers and Consultants. Telephone: Victoria 6521½ (two lines).

## SITUATIONS VACANT.

REQUIRED. Senior Draughtsmen and Section Leaders with first-class aircraft experience.—Write, giving experience, age, salary, etc., to HANDLEY PAGE, LTD., Cricklewood, N.W.2.

REQUIRED IMMEDIATELY. Sheet Metal Fitters, preferably accustomed to Metal Aircraft Construction. Suitable men will have a good run of work.—Apply, SHORT BROS., Rochester.

FOREMAN FITTER required to take charge of Fitting, Turning and Tool Room. State experience and wage required to Box No. 8192, c/o FLIGHT, 36, Great Queen Street, Kingsway, London, W.C.2.

REQUIRED. Several men with specialised knowledge and experience of Aero Engines and their installation, maintenance. Only first-class men need apply.—Box No. 8194, c/o FLIGHT, 36, Great Queen Street, Kingsway, London, W.C.2.

## NOTICE.

VACANCIES for Aeronautical Examiners in Aeronautical Inspection Department. Qualifications required, good general and technical education, thorough engineering training with experience in testing aircraft metallic and non-metallic materials and experience in either

(a) FOR AIRCRAFT EXAMINERS.

Construction aircraft components and assembling complete aircraft and testing installation of aero engines, or

(b) FOR ENGINE EXAMINERS.

Manufacture engine components and inspection complete aircraft engines. Knowledge general principles brake testing and measurement of horse power.

Annual salary £175-£10-£225 plus Civil Service bonus (present aggregate £259-£322).—Apply SECRETARY, Air Ministry (I.G.), Kingsway, W.C.2.

APPRENTICE CLERKSHIPS. (60) Boys of good education between 15½ and 17 years of age required for training as clerks for the Royal Air Force. Thorough training given. Prospects and pay good. Examinations held in London and provincial centres. Boys possessing recognised School Certificates entered direct without examination.—Full particulars from ROYAL AIR FORCE (Apprentice) Dept., (F.L.), Gwydyr House, Whitehall, London, S.W.1.

## ALAN COBHAM AVIATION Ltd.

150, New Bond Street, W.1.

'Phone' Mayfair 2908. 'Grams' "Talsundar, London."

Surveys conducted for Municipal authorities and commercial undertakings. In addition to choosing the best possible site, we prepare a layout and can contract for complete equipment.

AERODROME CONSULTANTS.

## ADVISORY.

EXPERIENCE AND REPUTATION TELLS. Consult CAPT. WARREN MERRIAM, A.F.C., A.F.R.Ae.S. for SOUND INDEPENDENT ADVICE on Aviation. Appreciations received from hundreds of Pupils and Clients since 1911, to date.—Write APPOINTMENTS, 64, Victoria Street, S.W.1.

## HIRE PURCHASE.

HIRE PURCHASE HAS COME. WE ARE THE FIRST in the field to offer HIRE PURCHASE Terms to buyers of second-hand aircraft.—Apply at once for our comprehensive list of machines and engines; all sold with C. of A.—MERRIAM'S AVIATION BUREAU, 64, Victoria Street, S.W.1. 'Phone: Victoria 8428. 'Grams: 'Exboxkite, Sowest, London.'

## AIRCRAFT CAMERAS.

"EAGLE" Aircraft Cameras and Equipment Specialists in Air Photographic Apparatus. Full particulars from the manufacturers and patentees, WILLIAMSON MANUFACTURING CO., LTD., Litchfield Gardens, Willesden Green, London, N.W.10. 'Phone: 0073-4 Willesden. 'Grams: "Kinetogram, Willroad, London." Contractors to the Admiralty, Air Ministry, War Office.

## MACHINES &amp; ENGINES FOR SALE.

DE HAVILLAND MOTH X Type, fitted Cirrus Mark II engine, dual control. Handley Page slotted wings. C/a till September. Flown approx. 100 hours ..... £500  
DE HAVILLAND MOTH X Type, fitted Cirrus Mark II engine, phones. C/a expires 82.8.29. Just overhauled. Blue and aluminium. Flown 175 hours ..... £485  
SE, 5A., fitted with 90 h.p. R.A.F. type engine, flown only five hours since complete overhaul. C/a twelve months from date of purchase ..... £185  
DE HAVILLAND MOTH, fitted Genet engine, completely overhauled by De Havilland. Not flown since overhaul. Painted blue and aluminium...£375  
DE HAVILLAND MOTH, fitted Mark II, Cirrus engine. C/A. Flown only 150 hours. Navigation lights. Extra tank. Compass, etc. ....£425  
All the above machines may be seen and tried by appointment.

Immediate delivery can be given of Gipsy Moths. MALCOLM CAMPBELL (London) 1927 Ltd., Byron House, St. James's Street, S.W.1. 'Phone: Regent 5171.

FOR SALE. One Three-seater convertible 80 Renault-Avro Aeroplane, perfect condition. Further particulars and price, apply:—Box No. 1653, c/o FLIGHT, 36, Great Queen Street, Kingsway, London, W.C.2.

LT.-COL. G. L. P. HENDERSON has a number of good aero engines for sale. Blackburn Thrush, Bristol Lucifer, Beardmore, Monosoupape, Le Rhone, Renault. All guaranteed in good order and very cheap.—Letters to CROYDON AERODROME.

ANZANI 6 cyl. radial, 45 h.p., complete with Zenith carburettor, Bosch magneto, propeller, instruments and controls. Can be seen running any time Bargain, £30.—BALDWIN'S GARAGE, Totnes.

CIRRUS ENGINE, MARK I, FOR DISPOSAL. Perfect condition, just been overhauled.—Box No. 40, c/o FLIGHT, 36, Great Queen Street, Kingsway, London, W.C.2.

## AIRCRAFT WANTED.

MODERN AIRCRAFT Purchased for Cash. Part exchanges for new machines.—BROOKLANDS SCHOOL OF FLYING, LTD. Telephone: Byfleet 437.

AEROPLANE AUTOMATIC DEVICES CO., LTD., are requiring several second-hand aeroplanes.—'Phone WATFORD 522 or write, SECRETARY, 23A, Aldenham Road, Watford.



## AIR TAXIS.

AIR TAXIS, LTD., Stag Lane Aerodrome, Edgware. Phone: Colindale 6307.

AEROFILMS LIMITED: Aerial Tours, Taxi Work, Aerial Photography, Air Survey. Colindale Avenue, Hendon, N.W.9. 'Phone: Colindale 6581 (2 lines).

## EAR DEFENDERS.

PREVENT injury due to excessive noise or change of pressure; small sounds heard as usual. Price, by post, 4/2 per pair.—THE MALLOR-A. MSTRONG Co., 39, Victoria Street, S.W.1. (NEW ADDRESS).

## FLIGHT TUITION.

LEARN TO FLY AT THE MIDLAND AERO CLUB. Four tuition machines, two fully qualified expert instructors. No waiting.—Particulars, Hon. SECRETARY, 22, Villa Road, Handsworth, Birmingham.

BROOKLANDS SCHOOL OF FLYING, LTD., Brooklands Aerodrome. 'Phone: Byfleet 437. Highest standard of instruction on "Moth" and Avro aircraft. Private accommodation on Aerodrome.

THE DE HAVILLAND SCHOOL OF FLYING, Stag Lane Aerodrome, Edgware, Middlesex. Fourteen machines: Nine Moths, five advanced training machines. Seven Pilot Instructors, Lecture Classes, Restaurant and Recreation Pavilion. The largest and most up-to-date civilian organisation for flying tuition in the British Empire.

LEARN AT LYPNE for lowest rates and quick tuition. No waiting list. Moth Machines. 65 miles from London. Experienced Instructor. Comfortable Club-room and Bar.—Apply, Hon. Sec., CINQUE PORTS FLYING CLUB.

SURREY FLYING SERVICES, Croydon Aerodrome (Telephone: Croydon 1736), have vacancies in their Flying School for Pupils at Moderate Rates. Avro Aircraft used. Residential accommodation at Aerodrome Hotel.

A FULL COURSE by ONE Instructor teaches you more and costs you less than constant changing over. LT.-COL. HENDERSON guarantees to teach you in a shorter time than is possible elsewhere, and undertakes to turn you out on Avros and Moths as an exceptional pupil in every sense of the word.—Apply by letter, Croydon Aerodrome.

## TUITION.

WE offer sound instruction in Aeroplane Design, Fitting and Rigging, and Aero-Engine Fitting and Kigging; also expert training for Ground Engineers (Categories A, B, C and D) and Special Pilots (Licence B). Write to-day for our "Aeronautical Engineering" Booklet.—INTERNATIONAL CORRESPONDENCE SCHOOLS, LTD., 182, International Buildings, Kingsway, London, W.C.2.

## CLOTHING.

WAINWRIGHT'S FOR FLYING CLOTHING. Contractors to Colonial and Foreign Governments. All clothing guaranteed. As supplied to the leading flyers of the day. Write for our special catalogue. Genuine R.A.F. Sidcot Suits, 5 ft. to 5 ft. 9 ins. only, 57/6. Best quality Leather Flying Coats in all styles, 85/-, 105/-, 126/-. Waterproof Flying Coats, lined teddy fleece and oilskin, 60/-. R.A.F. Sheepskin Flying Boots, all sizes, 25/-. R.A.F. Pilot's Gauntlet Gloves, 12/6. Flying Mask Goggles, unsplinterable, lined fur, 12/6. Inter-communication Earphones, complete connections and "Y" pieces, 12/6. Flying Helmets, trimmed fur, 12/6.—Inspect the largest stock of leather clothing at WAINWRIGHT'S, 300-302, Euston Road, London, N.W.1. 'Phone: Museum 6280.

LEWIS'S FOR FLYING EQUIPMENT OF EVERY DESCRIPTION. Leather Flying Coats, 87/6, 110/6, 120/6. Double Breasted, 65/6, 85/6, 105/6. New Flying Suits, all sizes, fitted fur collars, 60/6. Flying Helmets, best quality only, fur trimmed, 14/6. Flat or round type of phone, 5/6. Y-piece and Adapter, 3/3. Tubing and Rubber Connections, 3/6. Genuine Government Pilots' Gauntlets. Lambswool-lined Muffs, 12/6 per pair. Triplex Goggles of every description.—LEWIS'S, Leather Clothing Manufacturer, 19a & 27, Carburton Street, London, W.1. Museum 4793. No connection with any other firm.

## EMPLOYMENT.

BE PREPARED for the coming great "BOOM" in Aviation, and Register at once. (Licensed annually by L.C.C.).—MERRIAM'S AVIATION BUREAU, 64, Victoria Street, S.W.1.



**MODELS AND PARTS.**

**A. E. JONES, LTD.**  
The Original House for Model Aeroplanes and Accessories; Quality always of the highest standard. Price List free.—97, New Oxford Street, London, W.C.1. Tel.: Museum 4090.

**D.A.P. MODEL AEROPLANE CO.** The Pioneer Firm for Models, Accessories and Materials. Scale Models a speciality. Catalogue 4d.—187, Replingham Road, Southfields, S.W.18. Phone: Putney 0636.

**1-HORSEPOWER** Petrolmotor Castings, 9/9.

**2** Catalogue 3d.—MADISONS, Littleover, Derby.

**MODEL AIRCRAFT CATALOGUE.** 128 pages, with over 300 illustrations. Printed on Art Paper. The largest model list ever published. 1/6 post free.—WM. APPLEBY & Co., Jesmond, Newcastle-on-Tyne.

**WANTED.**

**WANTED TO PURCHASE**, 400/500 yards canvas similar to that used by Joy-Riding Co.'s for Field Screening. New or used material, if in good condition.—Reply, stating lowest price, to Box No. 8193, c/o FLIGHT, 36, Great Queen Street, Kingsway, London, W.C.2.

**FOR SALE.**

**NEW Wire Ropes, Aeroplane Strands and Cords;** half price.—THE LONDON ELECTRIC FIRM, Croydon. Telephone: Purley 1222 & 1223 (2 lines).

**AIRCRAFT INSTRUMENTS, ETC.** Special Offer:—Airspeed Indicators, new, in maker's boxes, 40-160 m.p.h., 5/9; Barometers converted from R.A.F. Altimeters, mounted in propeller bosses, 36/-; Radiator dashboard Thermometers, 50-100° Centigrade, 10/6; Cross Levels, 1/9; Revolution Indicators, 3 ft. flexible drive, 18/6; Shock Absorber, elastic, 1 in., 5d. yard; 25 lb. Oil Pressure Gauges, 5/6; 5-way Switch Boxes, 2/9. Above Postage Paid.—COLEY LTD., Ordnance Works, Queen Elizabeth Road, Kingston-on-Thames, Phone 0365. Free List obtainable of tools, wirestrainers, etc.

Anything in Rope, Wire, Canvas or Fabric Work.

FLOTATION



AIR BARS

17, Stoke Road, Guildford, Surrey.

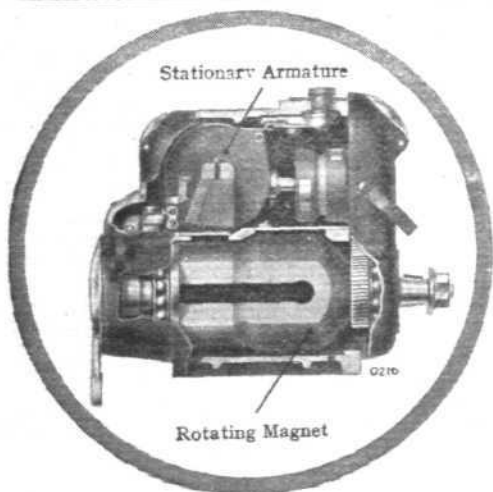
**AVIATION BOOKS.**

- "Duralumin," By LESLIE AITCHISON ... 7d.  
("Flight" Library—Vol. II.) Post Free  
"Pilot's 'A' Licence," By JOHN F. LEEMING ... 3/9  
Post Free  
"Aerobatics," By MAJOR OLIVER STEWART, M.C. ... 5/4  
Post Free  
"The Art of Flying," By CAPTAIN NORMAN MACMILLAN ... 5/6  
Post Free  
"The Strategy and Tactics of Air Fighting," By MAJOR OLIVER STEWART, M.C. ... 6/6  
Post Free  
"A B C of Flight," By W. LAURENCE LE PAGE ... 8/-  
Post Free

All above are obtainable upon application to:

"FLIGHT" Office,

36, Great Queen Street, Kingsway, W.C.2.



**Proved Reliability**

**SCINTILLA**

**MAGNETOS**

WERE USED ON TRANSATLANTIC AND PACIFIC FLIGHTS BY

Lindbergh, Chamberlin, Byrd, Brock, Schlee, Kingsford Smith, Miss Earhart.

**SCINTILLA LIMITED**

14, CLERKENWELL CLOSE, LONDON, E.C.1.

*The Aircraft Alloy*  
**"Vickers' Duralumin"**  
(Registered Trade Mark.)

**STRENGTH COMBINED WITH LIGHTNESS.**

AN alloy with the strength and hardness of Mild Steel, but having only one-third of its weight, and possessing excellent machining qualities.

All enquiries to—

**James Booth & Co. (1915), Ltd.**  
Argyle Street, Birmingham.

Telephone: East 1221 (Private Branch Exchange).  
Cables: Lieber's 5 Letter Code. Telegrams: "Booth, Birmingham."  
Bentley's Code, A.B.C. 5th and 6th Edition.



**COPPER, BRASS, PHOSPHOR BRONZE, TUBES, SHEETS, RODS and WIRE.**  
To AIR BOARD SPECIFICATIONS.

Specialities for Aircraft Work:—

**DRAWN PHOSPHOR BRONZE TUBES AND RODS.**

By Authority of The Air Ministry, Inspection Certificates are furnished with all our manufactures ordered to Air Board Specifications.

**CHARLES CLIFFORD & SON, Ltd., BIRMINGHAM.**  
ESTABLISHED 1776.

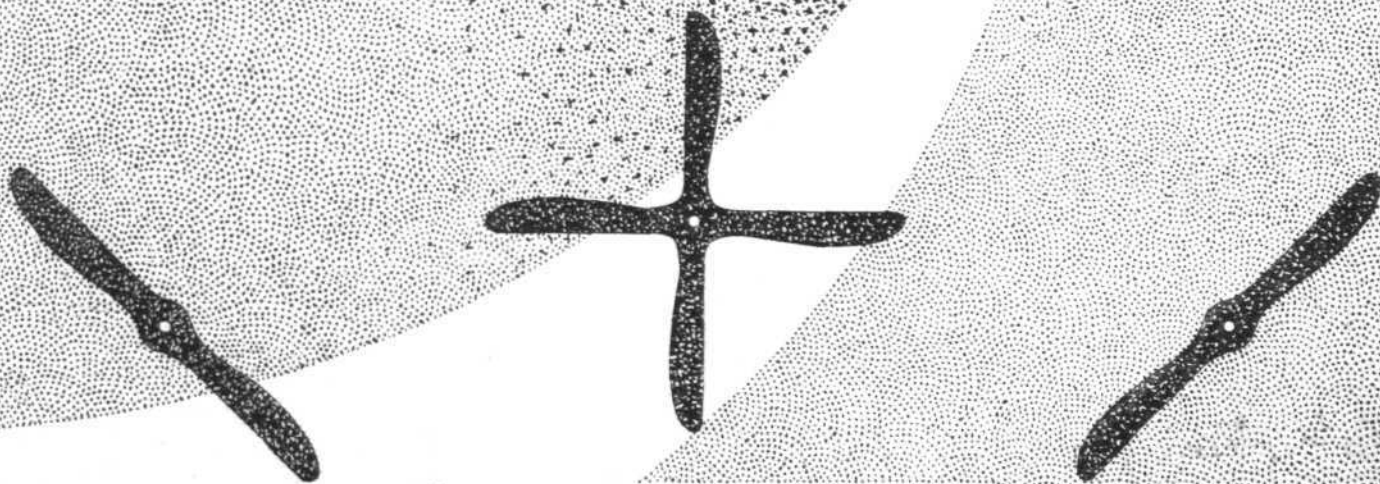
**Fit**  
**"Triplex"** Regd  
**and be safe!**

TRIPLEX SAFETY GLASS CO., LTD., 1, ALBEMARLE ST., LONDON, W.1.

Kindly mention "Flight" when corresponding with advertisers.



THE  
**PROPER**  
**SIGN OF**  
**EFFICIENCY**



'Phone: WEYBRIDGE 705.



# AIRCOOLED AIRCRAFT ENGINES.

## RELIABILITY and sound business-like EFFICIENCY—

these are the reasons why  
the Jupiter is the most widely-  
used aero engine in the world.

*There are types of "Bristol"  
Jupiter engines for every type of  
aircraft; ungeared Jupiters of 6.3,  
5.3 and 5 to 1 compression ratios;  
geared Jupiters of 5.8, 5.3 and  
5 to 1 compression ratios, and  
the gear-driven, supercharged,  
Series VII, Jupiter.*

**"For reliability fit the Jupiter."**



THE BRISTOL AEROPLANE CO., LTD.,  
FILTON — BRISTOL.

Telegrams:  
"AVIATION, BRISTOL."

Telephone:  
3906 BRISTOL.